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APPENDICES

Appendices italicized below have not been revised since the release of the Draft EIS/EIR and are not reprinted with the Final EIS/EIR. Remaining appendices are printed in whole or in part as indicated in parentheses below. Please visit http://www.ladwp.com/barrenridge to view the full appendices to the Final EIS/EIR.

Appendix A: Notice of Intent; Notice of Preparation; Federal Register Notice
Appendix B: Alternatives Development Report (reprinted in full)
Appendix C: Switching Station Preliminary Plans
Appendix D: Regulatory Framework (new information printed only)
Appendix E: Electric and Magnetic Fields Management Plan
Appendix F: Data Tables (new information printed only)
Appendix G: Biological Resources Occurrence Tables
Appendix H: Biological Assessment (revised and printed in full)
Appendix I: Biological Evaluation / Management Indicator Species Report (revised and printed in full)
Appendix J: Weed Risk Assessment (revised and printed in full)
Appendix K: TrackInfo Services FirstSearch Reports
Appendix L: Photo Simulations (new photo simulations printed only)
Appendix M: Electrical Effects Data Tables
Appendix N: Air Conformity Determination (revised and printed in full)
Appendix O: Programmatic Agreement (revised and printed in full)
Appendix P: Draft and Final EIS/EIR Distribution Lists (new information printed only)
Appendix Q: Construction Avian Protection Plan (revised and printed in full)
Appendix R: Comments Received and Responses to Comments (new appendix printed in full)

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December 2010

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Alternatives Development Report

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118418

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POWER
ENGINEERS

Barren Ridge Renewable Transmission Project
Alternatives Development Report

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INTRODUCTION

The City of Los Angeles Department of Water and Power (LADWP) is proposing the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access clean, renewable electrical energy resources in the Tehachapi Mountains and Mojave Desert areas, and to improve reliability and upgrade transmission capacity.

It has been determined that this Project is a major state and federal action that may significantly affect the quality of the human environment, therefore requiring preparation of an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) and an Environmental Impact Report (EIR) as required by the California Environmental Quality Act (CEQA). As recommended by both Council of Environmental Quality NEPA Regulations (40 C.F.R. 1506.2) and CEQA Guidelines (Section 15170) a joint EIS/EIR document will be prepared for the Project. The EIS/EIR is an informational disclosure document used to inform public agency decision makers and the public of the environmental effects of a project, identify possible ways to eliminate or minimize the potential significant or adverse effects, and describe reasonable alternatives to the Proposed Action /Project. The U.S. Department of Agriculture, Forest Service (Forest Service) and the U.S. Department of the Interior, Bureau of Land Management (BLM) are the responsible lead agencies for preparation of the EIS; LADWP is the responsible lead agency for preparation of the EIR.

This Alternatives Development Report (1) documents the range of alternatives that have been considered and evaluated, (2) describes the approach and methods used in evaluating potential alternatives according to guidelines established under the NEPA and the CEQA, (3) provides rationale for recommendation to eliminate or retain alternatives for further study in the EIS/EIR, and (4) recommends reasonable alternatives that would meet the purpose and need for the Project. The lead agencies' responsible authorities will decide the final alternatives that will be carried forward for full analysis in the EIS/EIR.

Environmental resource Technical Reports are being prepared for agency review. The Technical Reports will include full detailed impact analysis of each alternative that is currently under consideration as identified within this report, including the No Action alternative and a cumulative impact analysis. The Technical Reports will then serve as the basis for developing the EIS/EIR impact analysis for those alternatives approved by the lead agencies that will be carried forward for detailed consideration for the Project. This Alternatives Development Report includes preliminary environmental impact results from the Technical Reports.

1 PROJECT DESCRIPTION

The BRRTP is located in Kern and Los Angeles counties. It is approximately 75 miles in length and extends from the Barren Ridge Switching Station to Rinaldi Substation, and extends approximately 17 miles from the Castaic Power Plant to the proposed Haskell Canyon Switching Station. The proposed BRRTP includes the following:

1) Construction of approximately 60 miles of a 230 kilovolt (kV) double-circuit transmission line from the LADWP Barren Ridge Switching Station to Haskell Canyon;
2) Addition of approximately 12 miles of a 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant;
3) Upgrade of approximately 75 miles of the existing Barren Ridge-Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and the Rinaldi Substation;
4) Construction of a new electrical switching station in Haskell Canyon;
5) Expansion of the existing Barren Ridge Switching Station.

1.1 CONSTRUCTION OF NEW 230 KV TRANSMISSION LINE

The proposed double-circuit 230 kV transmission line in the BRRTP would carry two Alternating Current (AC) lines from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station in Haskell Canyon.

The proposed tower structures for the new lines are self-supporting double-circuit steel lattice towers fabricated from unpainted galvanized steel members. Depending on the environmental conditions of the surrounding terrain, the height of the proposed lattice structures would range from approximately 100-195 feet, with an average tower-to-tower span of 1,000 to 1,100 feet. Exact structure placement would be determined during engineering surveys and detailed design studies for the preferred route. A variety of engineering, constructability, existing access, and environmental issues are considered during structure siting within permitted rights-of-way.

Self-supporting, tubular steel poles (TSP) would be used for mitigating purposes where appropriate to reduce potential impacts, such as conflicts with cultivation on agricultural lands. The TSPs would have an average height range between 95-180 feet, depending on the conditions of the surrounding terrain, with an average tower-to-tower span of 700 to 800 feet.

The alignment of a tower along a transmission line determines whether it is a suspension, angle, or dead-end tower. Towers along the straight portion of a transmission line are known as suspension towers, and sometimes referred to as tangent towers. Angle towers are of the same basic configuration as suspension towers; however, they are located at angles in the transmission line and are designed to resist angular cable pulls. The main difference is in the tower "arms," insulator systems, and tower weights. At the end of a transmission line, large angle turn, or each side of a major crossing such as a large river, highway, or large valley, dead-end towers would be required to add longitudinal strength along the transmission line. They are built to be stronger, and often have a wider base and stronger insulator strings than the suspension towers that are located along a majority of the transmission line.

Between Power Plant #2 and the proposed Haskell Canyon Switching Station, existing four-circuit structures would be utilized for both the new double-circuit 230 kV transmission line and the reconductoring of the existing BR-RIN transmission line. To accommodate the additional weight, some of the existing towers may require minor modifications, such as replacement of steel members or reinforcement of footings.

The BRRTP will utilize self-supporting steel lattice structures and TSPs requiring concrete foundations. Steel lattice structures would require four footings (one for each leg); TSPs would require a single larger footing. Footings would be of the steel-reinforced concrete pier type and be cast in place. The concrete footings for lattice structures would be between 2.5 and 5.0 feet in diameter with an average depth of 20 feet depending on soil conditions. Single foundations for TSPs would consist of augured holes approximately five to seven feet in diameter and 15 to 30 feet deep, depending on conditions. Formwork and galvanized steel reinforcing would be assembled in the hole prior to casting concrete in place. Reinforcing steel would become integral to the lower leg of the steel lattice structure during installation. An above-ground concrete form placed over each hole would result in a final concrete foundation height of 0.5 to 2.0 feet above ground level.

The conductor (or "wires") being considered for the new double-circuit 230 kV transmission line and installation of the Castaic – Haskell Canyon #4 circuit on existing structures is a bundled 715.5 kcmil "Starling" ACSS/AW (aluminum conductor steel supported/aluminum-clad steel wire). The reconductoring of the BR-RIN transmission line between Barren Ridge Switching Station and Rinaldi Substation would require a bundled 1,433.6 kcmil "Merrimack" ACSS/TW/HS (aluminum conductor steel supported/trapezoidal wires/high strength) conductor.

Each circuit would consist of three phases (or conductors). To increase the current-carrying capability of the transmission lines and reduce power loss, the proposed Project would utilize bundled conductors installed for each phase. Bundled conductors consist of two or more conductor cables connected by a non-conducting spacer. The new double-circuit 230 kV transmission line utilizing double-bundled conductors would utilize a total of 12 conductors.

LADWP follows many of the standards established by the California Public Utilities Commission and the minimum conductor height above the ground, under normal operation of the line, is 31 feet (General Order 95). Greater clearances may be required in certain areas. Minimum conductor clearance would dictate the exact height of each tower based on topography and safety clearance requirements.

Insulators are used to provide the physical connection of conductors to structures. These system components are made of very low conducting materials (polymer insulators) that inhibit the flow of electric current from energized conductors to ground or to other energized system elements. Insulators and their associated hardware are to be configured in an "I" assembly to support conductors while maintaining required distances between phases and grounded structures. Each "I" string would consist of six-inch diameter insulators between six and eight feet long.

To shield conductors from the hazard of direct lightning strikes by transferring lightning currents into the ground, overhead ground wires (open shield wires) would be installed on the tops of new structures.

Construction of a transmission line involves the following general sequence of events: surveying the centerline; identifying and constructing access roads; clearing right-of-way and tower sites (including construction yards and batch plants); installing foundations; assembling and installing the towers; clearing, pulling, tensioning, and splicing sites; installing ground wires and conductors; installing counterpoise/ground rods; and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process. This would require several crews operating at the same time and in different locations.

Existing paved and unpaved highways and roads would be used where possible. Where new access roads are required, they would be constructed to support the weight of these vehicles and would typically be 16 feet wide, consisting of a 12- to 14-foot driving surface with a side drainage system between one and two feet in width. Permanent roads would be constructed where necessary for operation or maintenance, or where it is required by the landowner or land managing agency. Dependent upon final design and mitigation, some temporary access roads maybe constructed as part of the Project. These would typically be 16 foot wide roads, and would likely have no improved ditch drainage systems. Most temporary roads would be constructed by crushing vegetation. In some areas, material and topsoil from the temporary roads would be bladed to one or both sides to facilitate rehabilitation. Following construction, bladed material can be re-spread across the disturbed road section.

It is anticipated that several construction yards or staging areas would be required for storing materials, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres, and located near each end of the transmission line and at various locations approximately every 15 miles along the proposed line route.

1.2 ADDITION OF NEW 230 KV CIRCUIT

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of approximately 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures (towers 1-1 through 12-1). This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (2,156 kcmil "Bluebird" ACSS/AW) as that proposed for the new 230 kV transmission line.

The addition of a new circuit on existing towers would require many of the same activities of a new transmission line (surveying of right-of-way, rehabilitation of existing access and spur roads, clearing of right-of-way, conductor installation, ground rod installation, and cleanup). However, all work would be within existing right-of-way and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor.

1.3 RECONDUCTORING OF EXISTING TRANSMISSION LINE

LADWP proposes the reconductoring of approximately 75 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station to Rinaldi Substation (towers 176-1 through 251-1). The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of right-of-way, rehabilitation of existing access and spur roads, clearing of right-of-way, conductor installation, ground rod installation, and cleanup). The existing conductor would be pulled out using a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing right-of-way, with no additional right-of-way required. Some of the towers will need to be modified, replaced, and/or foundations reinforced/replaced to carry the additional weight of the new heavier conductor.

1.4 CONSTRUCTION OF NEW SWITCHING STATION

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest. It would be constructed on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge-Haskell Canyon, the existing Castaic-Northridge, Castaic-Sylmar, and Castaic-Olive, and the proposed Castaic to Haskell Canyon).

The station would be approximately 400 feet by 600 feet to accommodate the necessary equipment such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide, and would be enclosed by chain-link fencing with barbed-wire extension for security.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, concrete trucks, water trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks and mechanic trucks would also be required. Construction would require an estimated 12 months and approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut-and-fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. An approximately 16 foot wide paved road and 100 foot by 100 foot gravel parking area would be required for worker access and parking. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that approximately 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over an approximate 60 day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would connect into the switching station (e.g., the new and existing Barren Ridge-Haskell and Castaic-Haskell Canyon transmission lines) and would need support and require the installation of galvanized steel structures. High-voltage bus work consisting of aluminum jumpers and tubing would be installed.

1.5 EXPANSION OF EXISTING SWITCHING STATION

The existing Barren Ridge Switching Station is approximately 250 feet by 500 feet and contains three existing positions occupied by the Pine Tree Wind Development and BR-RIN Transmission Line; no additional positions are available.

During scoping, the original project description did not include the expansion of the Barren Ridge Switching Station. However, to allow connection of a new double-circuit transmission line and allow interconnections of future renewable energy projects in the Tehachapi Mountains and Mojave Desert area, LADWP is proposing to expand the existing station to the east side by 235 feet by 500 feet. The station would almost double in size (485 feet by 500 feet or approximately 5.6 acres) to include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and drainage area.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

It is estimated that approximately 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over an approximate 45 day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, concrete trucks, water trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks and mechanic trucks would also be required. An estimated eight months with approximately 60 workers would be required to expand the station.

1.6 CONSTRUCTION WORK FORCE AND SCHEDULE

Construction for the BRRTP is anticipated to commence in early 2012. The NEPA Lead Agencies' Record of Decision and CEQA Lead Agency Notice of Determination (anticipated in fall of 2010) must be made prior to right-of-way procurement and construction. The target date for commercial operation of the Project is Fall/Winter 2013.

The construction of the new double-circuit 230 kV transmission line from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station would take approximately 12.5 months to construct and require a total of approximately 134 workers, with a peak of 131 workers on any given day. The installation of a 230 kV circuit on existing double-circuit towers from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would take approximately a month and a half and approximately 35 workers would be needed for this portion of the Project. The upgrade and reconductoring of the existing BR-RIN would take approximately eight months and a total of approximately 155 workers to construct, with a peak of 120 workers on any given day. The construction of a new 400 foot by 600 foot Haskell Canyon Switching Station would take approximately 12 months to construct and require a total of approximately 60 workers, with a peak of 38 workers on any given day. The expansion of the existing Barren Ridge Switching Station would take approximately eight months and a total of approximately 60 workers, with a peak of 38 workers on any given day.

The BRRTP components are anticipated to be constructed in the staggered sequence illustrated below in Figure 1 and Table 1. The construction of all Project components would take approximately two years to construct. Approximately 447 total workers would be required with a peak of 173 workers on any given day during construction. Table 1 summarizes the BRRTP's construction workforce and schedule. To allow for any delays in the Project, three weeks of float time were included for the new 230 kV transmission line and reconductoring efforts, and an additional two weeks were included for the stringing of the second circuit between Castaic and Haskell Canyon.

FIGURE 1. ANTICIPATED CONSTRUCTION SEQUENCE

PROJECT COMPONENT	ANTICIPATED CONSTRUCTION SEQUENCE
New 230 kV Transmission Line	Weeks 1 – 54
New Haskell Canyon Switching Station	Weeks 1 – 46
Expansion of Barren Ridge Switching Station	Weeks 47 - 77
Addition of 230 kV Circuit	Weeks 53 - 88
Reconductor BR-RIN	Weeks 55 - 88

TABLE 1. CONSTRUCTION WORKFORCE AND SCHEDULE

PROJECT COMPONENT	CONSTRUCTION (START AND END WEEKS)	CONSTRUCTION DURATION (MONTHS)	TOTAL # OF WORKERS	PEAK # OF WORKERS AT ANY GIVEN TIME
New 230 kV Transmssion Line	1 – 54	12.5	134	131
New Haskell Canyon Switching Station	1 – 46	12	63	38
Expansion of Barren Ridge Switching Station	47-77	8	60	38
Addition of 230 kV Circuit	51 – 56	1.5	35	35
Reconductor BR-RIN	55 – 88	9	155	120
ALL COMPONENTS	**Weeks 1 – 88**	**22* months**	**412 Total Workers**	**173* Peak Workers**

*The value represents the total for the staggered construction of the Project components; it is not reflective of the sum of all the components.

2 NEPA & CEQA REQUIREMENTS FOR ALTERNATIVES

NEPA and CEQA both require consideration of a reasonable range of alternatives to the proposed Project that would feasibly attain most of the basic objectives of the Project, but avoid or substantially lessen any of the significant or adverse effects of the Project. The NEPA and CEQA requirements for the identification of Project alternatives are described in Sections 2.1 and 2.2.

2.1 NEPA

The Council on Environmental Quality's NEPA Regulations (40 C.F.R. 1502.14) require an EIS to present the environmental impacts of the proposed action and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision makers and the public. The alternatives analysis shall:

(a) Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b) Devote substantial treatment to each alternative considered in detail, including the proposed action, so that reviewers may evaluate their comparative merits.

(c) Include reasonable alternatives not within the jurisdiction of the lead agency.

(d) Include the alternative of no action.

(e) Identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

2.2 CEQA

CEQA Guidelines (Section 15126.6) state the following:

(a) An EIR shall describe a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.

(b) The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

(c) The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

(d) The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project.

(e) The EIR shall include the evaluation of the "No project" alternative.

(f) The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

3 IDENTIFICATION OF TRANSMISSION LINE SEGMENTS

A range of transmission routing segments were identified through a siting study, the scoping process, and supplemental studies and consultations. These studies were conducted to identify potential geographical routes (or segments) that could be further studied for the proposed double-circuit 230 kV transmission line between Barren Ridge and Haskell Canyon.

3.1 SITING AND ROUTING EVALUATION

In May of 2007, LADWP completed a 230 kV Transmission Line Siting Study. The study evaluated a number of environmental resources and engineering constraints in order to identify reasonable routing segments for the proposed Barren Ridge – Castaic 230 kV Transmission Project (the project name was changed to the Barren Ridge Renewable Transmission Project in March 2008).

A study area for the siting of an electrical transmission line was identified by utilizing physical features of the area to create boundaries. Interstate 5 became the western boundary, the northern boundary followed the Tehachapi Mountains, State Route 14 and Edwards Air Force Base created an eastern boundary, and the Santa Clara River and San Gabriel Mountains formed the southern boundary. The area measured approximately 819,000 acres (approximately 1,280 square miles) and was utilized as the basis for data inventory and mapping and sensitivity analyses (see Figure 2).

Environmental resource data was gathered within the study area for six disciplines: land use, visual resources, biological (wildlife and botanical) resources, cultural resources, water resources, and geohazards. Resource data was then mapped utilizing a geographic information system (GIS), and ground reconnaissance was completed to verify and supplement inventory mapping.

Resource sensitivity was developed for the following environmental resources: land use, cultural resources, biological resources, water resources, visual resources, and geohazards. Sensitivity is defined as a measure of probable adverse response of a resource to direct and indirect impacts associated with the construction, operation, and maintenance of the proposed high-voltage transmission line. Sensitivity levels were categorized as exclusion, high avoidance, moderate avoidance, or low avoidance. Areas of low sensitivity and linear features (highways, existing transmission lines, pipelines, aqueducts, etc.) were considered siting opportunities for the new 230 kV transmission line. The sensitivity levels for each of the environmental resources may be found in Appendix A.

Following the mapping of resource sensitivity constraints, GIS layers were overlaid to create a composite sensitivity map (see Figure 2). Exclusion areas are identified on the map with the color red, orange represents areas of high sensitivity, yellow denotes moderately sensitive areas, and gray represents low sensitivity or areas of opportunity for the siting of a new 230 kV transmission line.

The composite sensitivity map was used as a basis for identifying areas that provided the fewest constraints for the siting of a new transmission line. These areas are shaded in green in Figure 3 (Siting Study Corridor Map) and are generally within existing utility corridors. These corridors were further refined to consider reliability constraints and reasonable routing options for the new 230 kV transmission line from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station. For example, the Eastern "Acton" Corridor, located on the southern portion of Figure 3 from Vincent Substation to the Proposed Haskell Canyon Switching Station, was eliminated from further consideration because this corridor was already congested and there was no need to connect into the Vincent Substation. Another example was the Midway to Vincent Corridor that traversed west to east, instead of north (Barren Ridge Switching Station) to south (Rinaldi Substation). This corridor would be much longer and has the potential to impact the greatest amount of sensitive habitat on the Angeles National Forest.

The Composite Sensitivity Map did not reflect reconductoring of the existing BR-RIN transmission line from Barren Ridge Switching Station to Rinaldi Substation because routing alternatives for reconductoring were not considered. Later, the study area boundary was extended to the Rinaldi Substation.

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FIGURE 2. SITING STUDY COMPOSITE SENSITIVITY MAP.

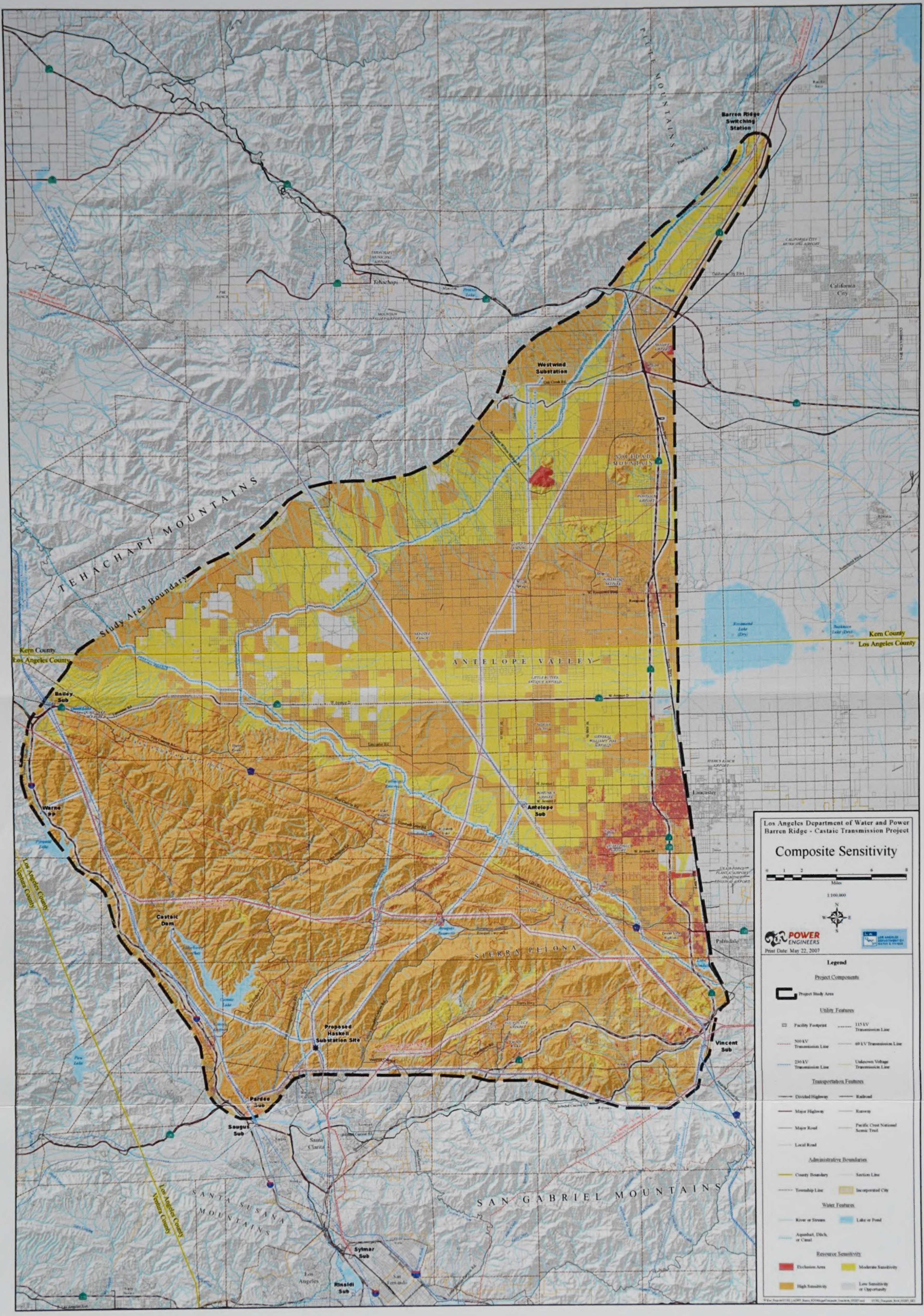
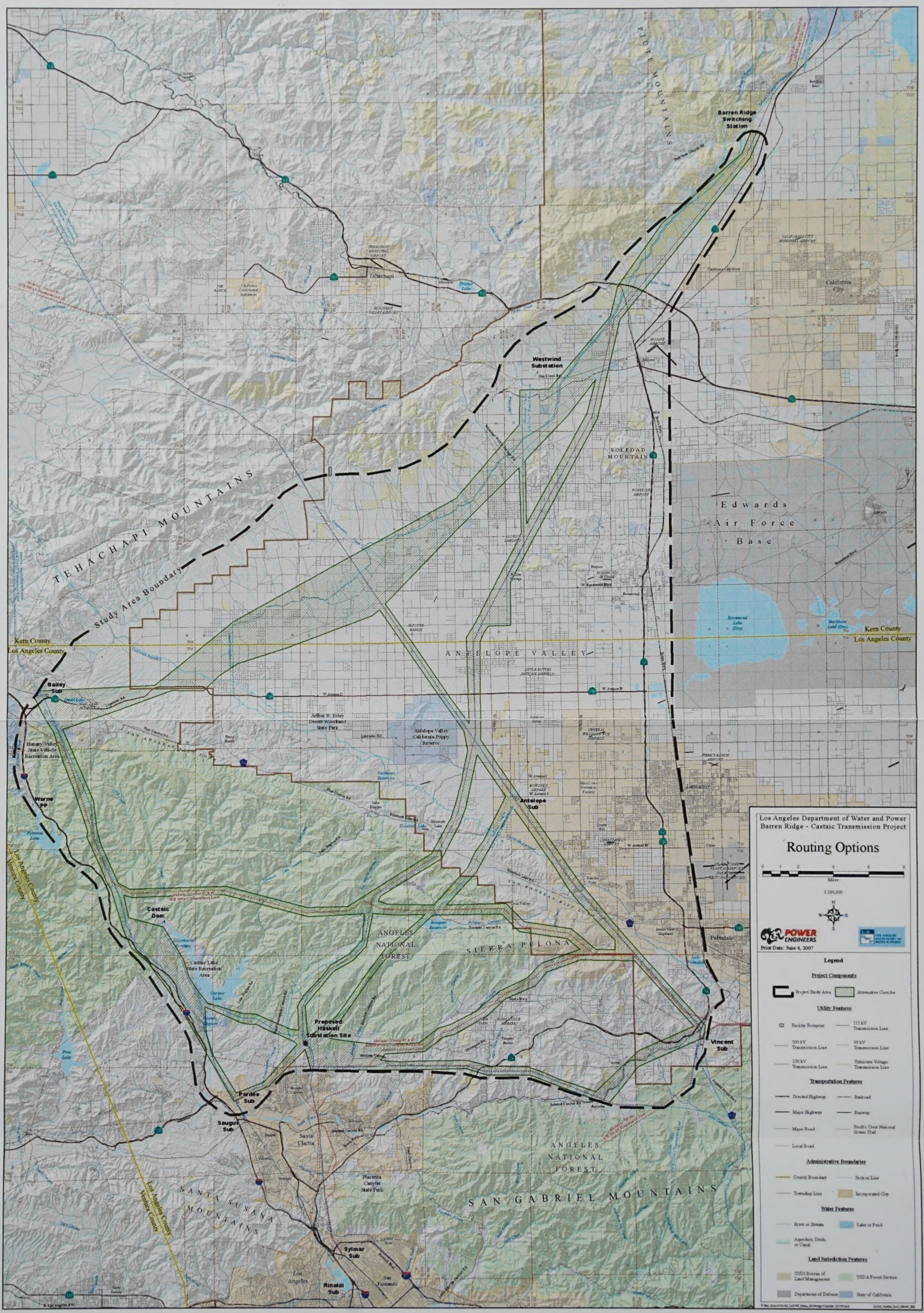

Los Angeles Department of Water and Power
Barren Ridge - Castaic Transmission Project
Composite Sensitivity
0 1 2 4 6 8
Miles
1:100,000
N
W
E
S
POWER ENGINEERS
Print Date: May 22, 2007
Legend
Project Components
Project Study Area
Utility Features
Facility Footprint
115 kV Transmission Line
500 kV Transmission Line
69 kV Transmission Line
230 kV Transmission Line
Unknown Voltage Transmission Line
Transportation Features
Divided Highway
Railroad
Major Highway
Runway
Major Road
Pacific Crest National Scenic Trail
Local Road
Administrative Boundaries
County Boundary
Section Line
Township Line
Incorporated City
Water Features
River or Stream
Lake or Pond
Aqueduct, Ditch, or Canal
Resource Sensitivity
Exclusion Area
Moderate Sensitivity
High Sensitivity
Low Sensitivity or Opportunity
Barren Ridge Switching Station
Westwind Substation
Tehachapi
California City
TEHACHAPI MOUNTAINS
Study Area Boundary
Kern County
Los Angeles County
ANTELOPE VALLEY
Rosamond Lake (Dry)
Bailey Sub
Warne PP
Antelope Sub
Lancaster
Palmdale
Castaic Dam
SIERRA PELONA
Proposed Haskell Substation Site
Vincent Sub
Pardee Sub
Saugus Sub
Santa Clarita
SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
Sylmar Sub
Rinaldi Sub
Los Angeles
Los Angeles County
Ventura County

FIGURE 3. SITING STUDY CORRIDOR MAP.


Los Angeles Department of Water and Power
Barren Ridge - Castaic Transmission Project
Routing Options
0 1 2 4 6 8
Miles
1:100,000
N
W
E
S
POWER ENGINEERS
Print Date: June 4, 2007
Legend
Project Components
Project Study Area
Alternative Corridor
Utility Features
Facility Footprint
115 kV Transmission Line
500 kV Transmission Line
69 kV Transmission Line
230 kV Transmission Line
Unknown Voltage Transmission Line
Transportation Features
Divided Highway
Railroad
Major Highway
Runway
Major Road
Pacific Crest National Scenic Trail
Local Road
Administrative Boundaries
County Boundary
Section Line
Township Line
Incorporated City
Water Features
River or Stream
Lake or Pond
Aqueduct, Ditch, or Canal
Land Jurisdiction Features
USDI Bureau of Land Management
USDA Forest Service
Department of Defense
State of California
Barren Ridge Switching Station
PIUTE MOUNTAINS
Tehachapi
California City
Westwind Substation
SOLEDAD MOUNTAIN
Mojave
TEHACHAPI MOUNTAINS
Study Area Boundary
Edwards Air Force Base
Rosamond
Rosamond Lake (Dry)
Buckhorn Lake (Dry)
Kern County
Los Angeles County
ANTELOPE VALLEY
Bailey Sub
Hungry Valley State Vehicle Recreation Area
Warne PP
Pyramid Lake
Arthur B. Ripley Desert Woodland State Park
Antelope Valley California Poppy Reserve
Antelope Sub
Lancaster
Palmdale
Castaic Dam
Castaic Lake State Recreation Area
ANGELES NATIONAL FOREST
SIERRA PELONA
Proposed Haskell Substation Site
Vincent Sub
Pardee Sub
Saugus Sub
Santa Clarita
Placerita Canyon State Park
SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
Sylmar Sub
Rinaldi Sub
Los Angeles
San Fernando
Los Angeles County
Ventura County

3.1.1 Siting and Routing Evaluation Results

Following the identification of potential transmission line corridors as shown on Figure 3, a field review was conducted to verify the feasibility of those corridors. Several potential corridors were eliminated from further consideration due to dense urban development, other conflicting land uses, transmission reliability constraints, or the potential to add significant length to the proposed transmission line. As a result, over 200 miles of preliminary routing opportunities or corridors (also known as Segments A through K) were identified for the siting of a new 230 kV transmission line, reconductoring of an existing transmission line, and addition of a new 230 kV circuit. A brief discussion of the Segments are included below and illustrated in Figure 4 (Proposed Project and Preliminary Alternative Corridors Map). Table 2 summarizes the total length and miles of private and public lands traversed by each segment. The segments were established using existing transmission lines, where present, as the centerline of the half-mile-wide corridors. The Segments were considered routing opportunities for the proposed Project. These segments were later combined to create end-to-end routing "alternatives" as discussed further in this report, in Section 6.0.

Segment A is 13 miles long; it traverses 4 miles of BLM-managed lands and 9 miles of privately owned lands. It runs from LADWP's Barren Ridge Switching Station to just north of Mojave and is located on approximately four miles of BLM-managed lands. It contains LADWP's existing 230 kV Barren Ridge – Rinaldi Transmission Line (BR-RIN) and 500 kV Pacific Direct Current Intertie (PDCI).

Segment B is 27.5 miles long and traverses privately owned lands the entire length. It starts just north of Mojave, CA and heads south towards the Antelope Valley California Poppy Reserve. It also contains LADWP's existing 230 kV BR-RIN and 500 kV PDCI.

Segment C is 22 miles and traverses privately owned lands the entire length. It also starts just north of Mojave and heads southwest to approximately Cottonwood Creek. This corridor would be located parallel to the Los Angeles Aqueduct.

Segment D is 48 miles long; traverses 0.3 miles of California Department of Fish and Game-managed lands, 16 miles of USFS-managed lands, and 32 miles of privately owned lands. It generally parallels the Los Angeles Aqueduct from about Cottonwood Creek and heads south to Lancaster Road, and then west to the Interstate 5 utility corridor within the Angeles National Forest. Five high-voltage transmission lines and oil and gas pipelines occur along the Interstate 5 section of the segment.

Segment E is 11 miles long and traverses privately owned property the entire length. It starts just south of Cottonwood Creek and heads southeast towards the Antelope Valley California Poppy Reserve. Two existing high-voltage transmission lines occur in this corridor.

Segment F is the shortest corridor at 4 miles long and traverses privately owned property the entire length. It and extends from the Antelope Valley California Poppy Reserve to Southern California Edison's (SCE's) Antelope Substation. Two existing high-voltage transmission lines also occur in this segment.

Segment G is 21 miles long and traverses 8 miles of privately owned lands, and 13 miles of USFS-managed lands. It runs from the Antelope Valley California Polly Reserve to Haskell Canyon. LADWP's existing 230 kV BR-RIN and 500 kV PDCI also occur along this segment.

Segment H is 20 miles long and traverses 7 miles of privately owned lands and 13 miles of USFS-managed) runs mostly parallel to SCE's Antelope-Pardee line that was recently constructed. The last 1.5 miles follow the route of the old SCE 66 kV Saugus-Del Sur line, which has been removed, and fall outside the designated Forest Service corridor in order to take a more direct route into the Haskell site.

Segment I is 31 miles long and traverses 27 miles of privately owned lands and 4 miles of USFS-managed lands. It starts at the Antelope Substation headed southeast to Palmdale (four existing high-voltage transmission lines occur along this portion), then makes a sharp turn and heads southwest to

Haskell Canyon (two of LADWP's existing high-voltage transmission lines occur along this portion). A majority of this segment would be located outside of NFS lands.

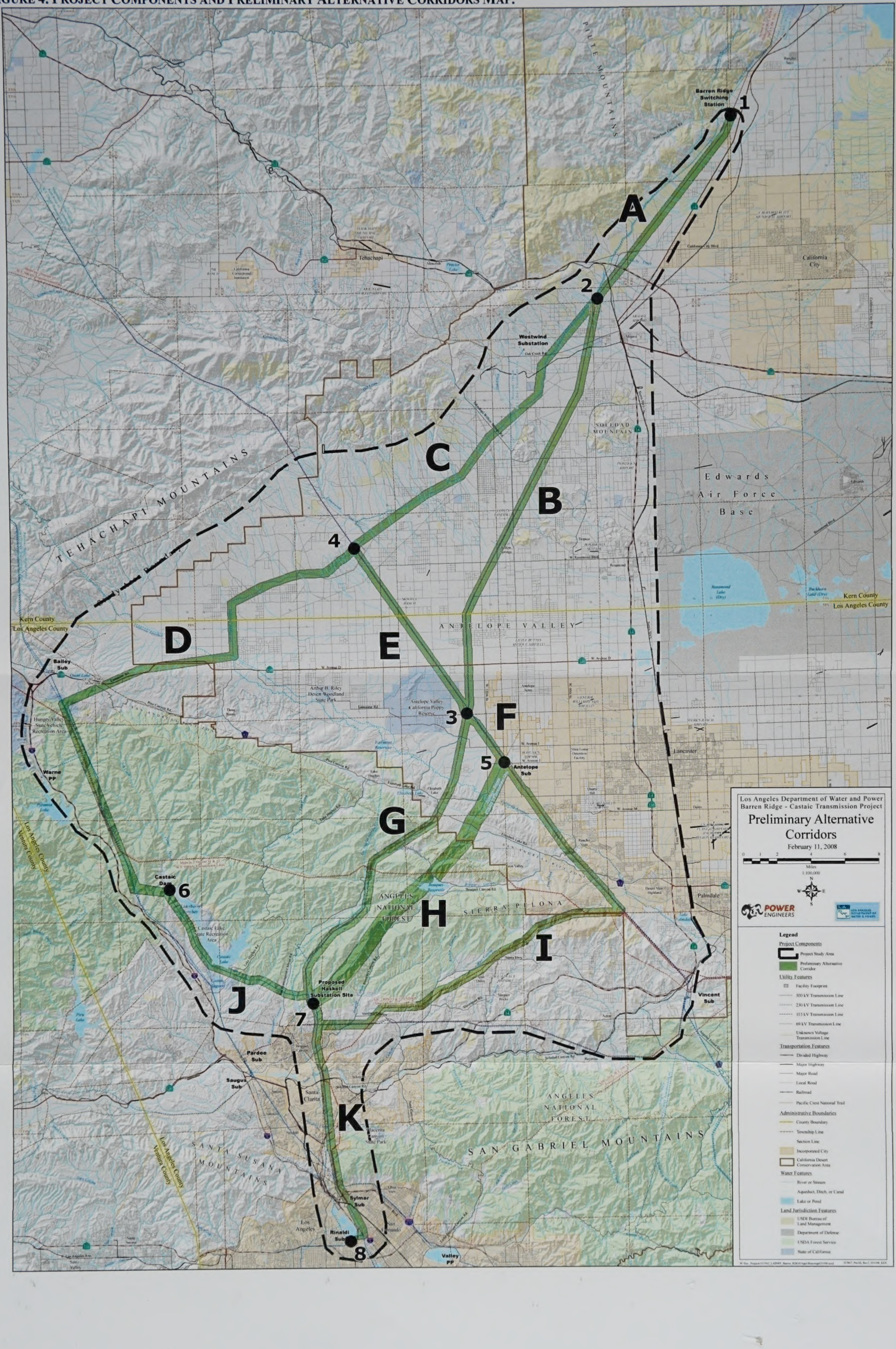
Segment J is 12 miles long and traverses 4.7 miles of privately owned lands and 7.3 miles of Los Angeles County Department of Parks and Recreation (LAP & R)-managed lands. It runs parallel to LADWP's existing Castaic to Rinaldi 230 kV transmission line from the Castaic Power Plant to Haskell Canyon.

Segment K is 15.4 miles long and traverses 14. miles of privately owned lands, and 0.8 miles of Mountains Recreation and Conservation Authority (MRCA)-owned lands. It starts at Haskell Canyon and heads south to LADWP's Rinaldi Substation. This segment has seven existing LADWP transmission lines.

TABLE 2. SEGMENT LENGTHS AND JURISDICTIONS TRAVERSED.

Segment	Total Length (miles)	Jurisdiction
A	13	4 miles BLM 9 miles private
B	28	28 miles private
C	22	22 miles private
D	48	0.3 CDFG 16 miles USFS 32 miles private
E	11	11 miles private
F	4	4 miles private
G	21	13 miles USFS 8 miles private
H	20	13 miles USFS 7 miles private
I	31	27 miles of private 4 miles of USFS
J	12	7 miles LAP&R 4 miles private
K	15	1 mile MRCA 14 miles private

FIGURE 4. PROJECT COMPONENTS AND PRELIMINARY ALTERNATIVE CORRIDORS MAP.


A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
Barren Ridge Switching Station
Westwind Substation
Bailey Sub
Antelope Sub
Castaic Dam
Proposed Haskell Substation Site
Vincent Sub
Pardee Sub
Saugus Sub
Sylmar Sub
Rinaldi Sub
Valley PP
Warne PP
Tehachapi
California City
Lancaster
Palmdale
Santa Clarita
PIUTE MOUNTAINS
TEHACHAPI MOUNTAINS
SOLEDAD MOUNTAIN
Edwards Air Force Base
ANTELOPE VALLEY
Rosamond Lake (Dry)
Kern County
Los Angeles County
Ventura County
ANGELES NATIONAL FOREST
SIERRA PELONA
SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
Castaic Lake State Recreation Area
Hungry Valley State Vehicle Recreation Area
Arthur B. Ripley Desert Woodland State Park
Antelope Valley California Poppy Reserve
Los Angeles Department of Water and Power
Barren Ridge - Castaic Transmission Project
Preliminary Alternative Corridors
February 11, 2008
0
1
2
4
6
8
Miles
1:100,000
N
W
E
S
POWER ENGINEERS
LOS ANGELES DEPARTMENT OF WATER & POWER
Legend
Project Components
Project Study Area
Preliminary Alternative Corridor
Utility Features
Facility Footprint
500 kV Transmission Line
230 kV Transmission Line
115 kV Transmission Line
69 kV Transmission Line
Unknown Voltage Transmission Line
Transportation Features
Divided Highway
Major Highway
Major Road
Local Road
Railroad
Pacific Crest National Trail
Administrative Boundaries
County Boundary
Township Line
Section Line
Incorporated City
California Desert Conservation Area
Water Features
River or Stream
Aqueduct, Ditch, or Canal
Lake or Pond
Land Jurisdiction Features
USDI Bureau of Land Management
Department of Defense
USDA Forest Service
State of California

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3.2 SCOPING PROCESS

In Spring 2008, public scoping for the BRRTP was conducted to determine the scope of issues to be addressed, and identify the range of actions, alternatives, mitigation measures, and environmental effects to be analyzed in the Draft EIS/EIR.

Scoping was initiated by publication in the Federal Register of a Notice of Intent (NOI) to prepare a joint EIS/EIR. A similar Notice of Preparation (NOP) was filed with the California State Clearinghouse on April 7, 2008. The NOI/NOP requested all comments be received by May 7, 2008. It described the proposed Project, the agencies' scoping and environmental review process, and contact information. It served as an invitation for state, local, and other federal agencies, as well as the general public, to provide comments on the scope and content of the EIS/EIR. Approximately 500 NOPs were distributed to federal, state, regional, and local agencies, elected officials, organizations and Native American groups.

In addition to the distribution of the NOP and publication of the NOI, approximately 7,200 newsletters were sent to agency representatives, elected officials, Native American Tribes, interested parties and organizations, and property owners within 500 feet of both sides of the proposed Project and preliminary alternatives in Los Angeles and Kern Counties. The newsletters contained the Project description, purpose and need for the Project, and map, described the environmental review process, announced public scoping meetings, and contained contact information, in both English and Spanish.

The Forest Service, BLM and LADWP conducted seven public scoping meetings from April 22 to May 1, 2008 in the following locations: Santa Clarita, Castaic, Agua Dulce, Lake Hughes/Elizabeth Lake, Lebec, Palmdale, and California City. The scoping meetings provided an opportunity to share information regarding the proposed Project and the decision-making processes, and listen to public and agency views on the range of issues and alternatives to be considered during the preparation of the Draft EIS/EIR. All meetings were conducted in an "open house" format to allow participants to attend any time between 5:30 p.m. and 8:30 p.m. A brief presentation video was shown by the Project team at 7 p.m. followed by a general "comment and question" session.

Additional opportunities for public input and information sharing throughout the scoping process were provided via a Project website, an e-mail address, a toll-free hotline, and formal press releases by the lead agencies. Meetings with several local town councils were also attended by representatives of the lead agencies.

3.2.1 Scoping Process Results

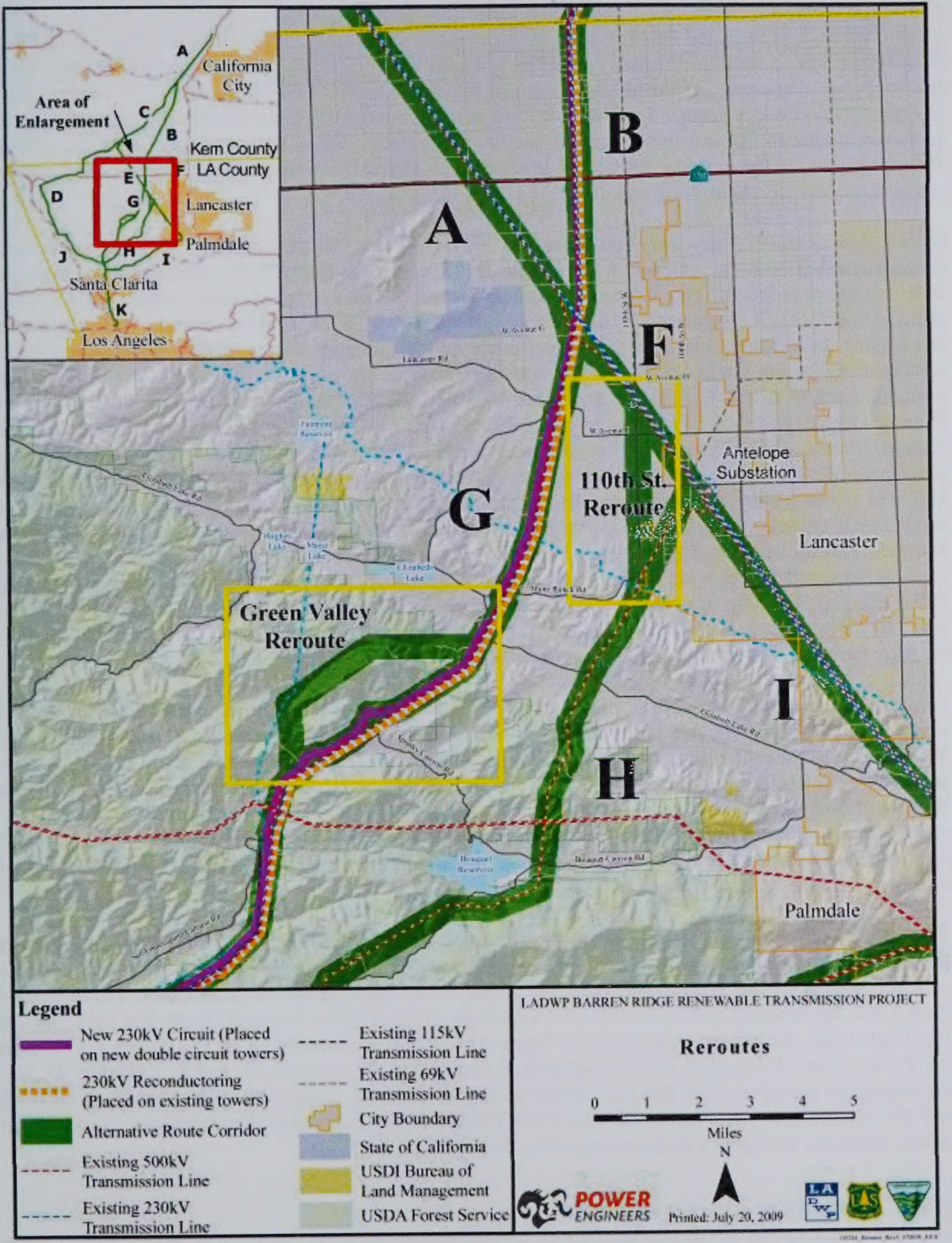
The scoping process indicated a number of primary concerns about potential impacts of the proposed Project or alternatives. These concerns covered a broad range of input, and included opposition to the Project, support for Project objectives but opposition to certain routes, information on both environmental and social impacts, concerns over the process used to involve the public, suggestions for alternatives to the proposed Project, and suggestions for mitigating impacts. Details of the input received during public scoping can be found in the Barren Ridge Renewable Transmission Project Scoping Report.

The comments received at the scoping meetings, as well as via phone, email and mail, were analyzed to identify the significant issues and formulate alternatives that would avoid or minimize adverse impacts to environmental resources. Issues are defined as "a point of disagreement, debate, or dispute about the proposed action based on effects identified through scoping." Issues were considered non-significant if they were: 1) outside the scope of the proposed action; 2) irrelevant to the decision to be made; 3) already decided by law, regulation, or policy; or 4) conjectural or not supported by scientific evidence. It is important to note that the source of these issues was both internal (inter-agency) and external (elected officials and public). Information from the draft technical reports was also considered in determining if issues are non-significant based on preliminary resource impacts. Analysis of this scoping information identified significant issues associated with the following resources: biological resources, cultural resources, earth resources, water resources, land use, and recreation. These resources and their associated significant issues have been considered in the development of alternatives to the proposed action and will drive the analysis in the EIS/EIR. See Table 3 in Section 4.2 for a list of the significant issues identified through this scoping process and post-scoping public input.

The public suggested a number of alternatives to the proposed Project. Some residents in the Project area recommended the use of tubular steel mono poles instead of lattice steel structures, or suggested undergrounding of transmission lines. Some residents recommended the use of a single-tower system (multi-circuit towers) to accommodate the need for existing and proposed towers, as well as to minimize right-of-way expansion by combining new and existing lines on one set of structures. Direct Current (DC) lines were recommended as an alternative to the proposed alternating current (AC). Residents also requested the use of Niobium wire as an alternative to aluminum or copper wire. Electrical generation within the City of Los Angeles was recommended to avoid long distance electrical transmission distribution and impacts to rural communities. The BLM and Forest Service inquired about upgrading the electrical transmission system to a 500 kV instead of 230 kV transmission system.

Two localized routing alternatives were proposed by the public during the scoping period. The first, referred to as the Green Valley Re-route, was proposed by Green Valley residents and is located approximately one quarter-mile west of Green Valley along an existing fire road through NFS lands. This re-route would avoid possible impacts to the Green Valley community. The second routing suggestion, referred to as the 110th Street Re-route, was proposed by the residents along Segments F and H. The modification of Segment F would parallel 110th Street and connect Segments F and H instead of following along the existing transmission lines to Antelope Substation. This modification was proposed to follow property lines and avoid bisecting private property in the area. Please refer to Figure 5 for an enlarged view of the proposed reroutes.

FIGURE 5. PROPOSED RE-ROUTE MAP.


A
California City
Area of Enlargement
C
B
Kern County
LA County
E
F
D
G
Lancaster
Palmdale
J
H
I
Santa Clarita
K
Los Angeles
B
A
F
Antelope Substation
110th St. Reroute
G
Lancaster
Green Valley Reroute
I
H
Palmdale
Legend
New 230kV Circuit (Placed on new double circuit towers)
230kV Reconductoring (Placed on existing towers)
Alternative Route Corridor
Existing 500kV Transmission Line
Existing 230kV Transmission Line
Existing 115kV Transmission Line
Existing 69kV Transmission Line
City Boundary
State of California
USDI Bureau of Land Management
USDA Forest Service
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
Reroutes
0
1
2
3
4
5
Miles
N
POWER ENGINEERS
Printed: July 20, 2009

3.3 INTERDISCIPLINARY ROUTE IDENTIFICATION MEETING

In January 2009, the BRRTP interdisciplinary team, comprised of resource specialists from the Forest Service, BLM, LADWP, and the third-party environmental consultants, conducted a two-day workshop to identify end-to-end routing alternatives for the proposed double-circuit 230 kV transmission line from Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station. A total of nine environmental resource groups were involved (air quality, biological resources, cultural resources, earth resources, engineering, land use/recreation, public involvement, visual resources and water resources). This workshop did not consider the no action alternative, alternative system configurations, construction methods, or detailed engineering and design.

Within this workshop, key members from the Forest Service, BLM, LADWP, and the third-party environmental consultants, referred to as the Steering Committee, shared information with the team on their recommendation for elimination of Segment D and the Green Valley Modification from further study in the EIS/EIR. Segment D was initially recommended for elimination because it would create overloading of existing electrical facilities south of the Castaic Power Plant, require significant modifications to the Castaic Power Plant and expansion of right-of-way south of Castaic, result in potential impacts to the Old Ridge Route (an eligible historical district on the National Register of Historic Places), and face difficulties in construction of new towers on unstable terrain on the Angeles National Forest. This recommendation was later reconsidered and Segment D was brought back into consideration based on public input during the post-scoping public involvement meetings (see Section 3.4). The Green Valley Re-route was also recommended for elimination from detailed study because it would create environmental impacts to Angeles National Forest lands that would be over a mile from the designated utility corridor. These impacts included crossing the Pacific Crest Trail over a mile from the existing lines, and construction disturbance along a relatively undisturbed and intact riparian area, South Portal Canyon. To minimize impacts to the community of Green Valley, LADWP proposed siting the new 230 kV transmission line a few hundred feet north of the existing lines to avoid the residences within the community, which was the objective of the original Green Valley Re-route.

Prior to the workshop, the BRRTP interdisciplinary team gathered into environmental resource groups and compiled their inventories and potential impacts of the remaining routes into impact tables. Maps were developed for each resource showing the levels of impact, represented by changes in color along the centerlines. At the meeting, each resource group presented potential impacts to their resource to the interdisciplinary team. The team took into consideration the potential significant issues from the construction, operation and maintenance of the proposed Project. The significant issues were then used to identify and assess the reasonable combinations of routing alternatives to the proposed action that would avoid or minimize adverse effects.

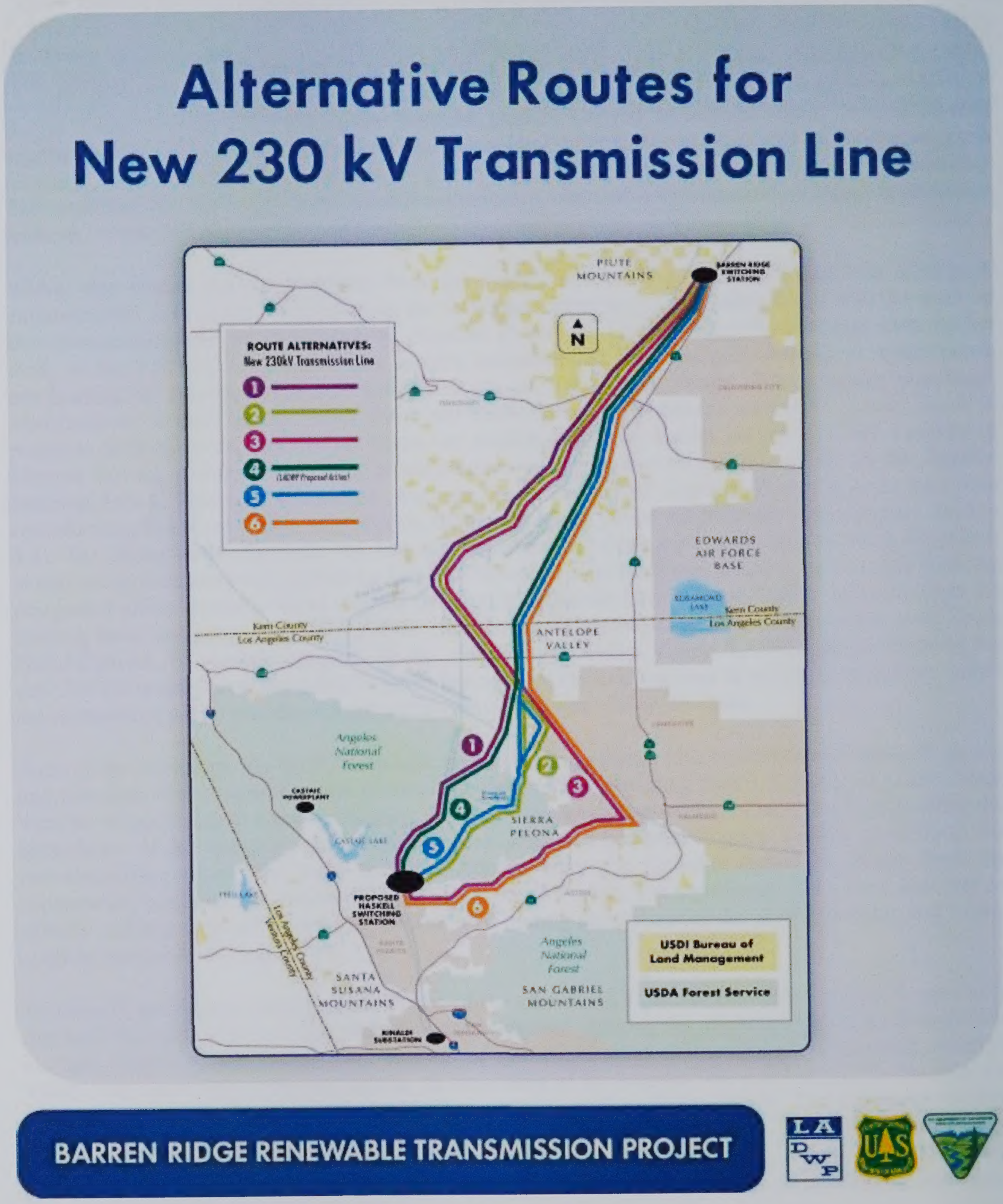
To identify end-to-end routing opportunities of the new 230 kV transmission line, localized sub-routes that had common endpoints were identified and compared utilizing the physiography of the Project. The northern portion of the Project area consists of flat desert areas of the Mojave Desert and Antelope Valley, and the southern portion contains the mountains of the Angeles National Forest. For example, the Antelope Valley sub-routes consisted of 1) Segments C and E or 2) Segment B. The sub-routes through the Forest were 1) Segment G, 2) Segments F and H, or 3) Segments F and I. (Segment D was recommended for elimination and not considered in the sub-route comparison.) The process of building end-to-end routing alternatives for the new 230 kV transmission line included comparisons of significant issues, tradeoffs, and agency concerns regarding the segments.

3.3.1 Route Identification Results

Six routing alternatives for the siting of a new 230 kV transmission line were identified for further study as a result of the interdisciplinary meeting. Refer to Figure 6 for the location of the routing alternatives.

The other Project components (reconductoring of the existing Barren Ridge-Rinaldi Transmission Line, addition of a new 230 kV circuit, and expansion of the existing Barren Ridge Switching Station) would utilize existing facilities and rights-of-way; therefore, these components do not have routing alternatives. These six routing alternatives, and others associated with the reconsideration of Segment D, are discussed in detail in section 6.0, with recommendations addressing their feasibility, ability to meet purpose and need, and potential to reduce environmental effects.

FIGURE 6. PRELIMINARY ALTERNATIVE ROUTES FOR THE NEW 230 KV TRANSMISSION LINE.*



Alternative Routes for New 230 kV Transmission Line

PIUTE MOUNTAINS
BARREN RIDGE SWITCHING STATION
N
ROUTE ALTERNATIVES:
New 230kV Transmission Line
1
2
3
4
(LADWP Proposed Action)
5
6
EDWARDS AIR FORCE BASE
Kern County
Los Angeles County
Kern County
Los Angeles County
ANTELOPE VALLEY
Angeles National Forest
1
2
3
4
5
6
CASTAIC POWERPLANT
CASTAIC LAKE
SIERRA PELONA
PROPOSED HASKELL SWITCHING STATION
Los Angeles County
Ventura County
SANTA SUSANA MOUNTAINS
Angeles National Forest
SAN GABRIEL MOUNTAINS
RINALDI SUBSTATION
USDI Bureau of Land Management
USDA Forest Service

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

*The map shows preliminary alternatives that were recommended to be carried forward in the Draft EIS/EIR but were revised in Spring 2009 due to input from the public and further modifications of the routing alternatives.

3.4 INFORMATIONAL PUBLIC MEETINGS

In February 2009, LADWP conducted five informational public meetings in Lake Hughes, Mojave, Agua Dulce, Saugus, and Leona Valley. The public received updates regarding scoping results, preliminary resource studies, and the evaluation of alternative transmission line routes. These meetings also provided the public with additional opportunities to provide comments about the Project. The Project team presented the six routing alternatives for the new 230 kV transmission line identified for further study in the EIS/EIR, along with the recommendation to eliminate Segment D and the Green Valley Re-route from further study.

Public involvement is an integral part of the environmental review process. Although the scoping period ended in May 2008, all comments received via mail, email, and the Project hotline, and at the informational public meetings, have been accepted and considered by the Project Team. The comments received were very similar to those received during the scoping period. Residents in the Project area suggested localized alternatives to the proposed Project, consideration of in-basin generation of renewable resources, and sharing of transmission lines and renewable resources with other utility companies. Residents in Green Valley and Elizabeth Lake recommended the use of multi-circuit towers instead of numerous double- or single-circuit towers. Undergrounding was suggested along Segments B, C, and E, and in Elizabeth Lake, Green Valley, Leona Valley, and the Antelope Valley. Tubular steel poles (also known as monopoles) were recommended in Antelope Valley. To minimize the number of new transmission line corridors, residents in Quartz Hill recommended moving the 110th Street Reroute to 115th Street (following SCE's Tehachapi Renewable Transmission Project's proposed alignment through the area). The public also requested consideration of a 500 kV transmission line system instead of the proposed 230 kV transmission line system. Residents along Segment D suggested utilization of existing transmission line corridors instead of impacting undisturbed areas. Questions were asked about electromagnetic fields (EMF), eminent domain, and property values. Mitigation to purchase land around Lake Elizabeth was also suggested. The public as well as elected officials strongly recommended reconsideration of Segment D to avoid impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, and Agua Dulce.

As a result of the public meetings, BLM, the Forest Service, and LADWP modified Segment D. This modification made the segment feasible for the Project and is thus being carried forward into a routing alternative for consideration in the EIS/EIR. Further discussion on Segment D may be found in Section 5.3.2. Also, the list of significant issues was revised to include EMF, fire suppression, and potential for loss of habitat.

4 ALTERNATIVES EVALUATION METHODOLOGY

To determine which alternatives would be analyzed in the Draft EIS/EIR, alternatives were evaluated to determine whether they would:

1. Attain the purpose and need of the Project, as well as most of the basic objectives of the Project.
2. Have the potential to avoid or substantially lessen any of the significant or adverse effects of the Project.
3. Be considered feasible.

4.1 MEETING THE PURPOSE AND NEED

Each Lead Agency has its own purposes to consider in evaluating a proposed project/action and the alternatives to the proposed project/action. NEPA (CFR Title 40 Section 1502.13) and CEQA (Guidelines Section 15124(b)) explain that an agency's statement of objectives or purpose and need should describe the underlying purpose of the proposed project or need for action. Each agency's jurisdiction is unique and the decision it is called upon to make is also unique; thus, each agency's statement of objectives or purpose and need is different. Therefore, the three Lead Agencies for the BRRTP have prepared their own purpose and need statements for the BRRTP, which are summarized below. Detailed purpose and need statements by the lead agencies may be found in Chapter 1 of the EIS/EIR.

4.1.1 LADWP'S Purpose and Need

LADWP's purpose and need for BRRTP is to:

Reduce the environmental impacts associated with greenhouse gas emissions and create a more sustainable environment.
Assist LADWP to meet Renewable Portfolio Standard (RPS) goals.
Meet the growing electrical energy demands of the City of Los Angeles.
Allow interconnection and expansion of LADWP's renewable energy in the Tehachapi Mountains and Mojave Desert areas.
Increase LADWP's system reliability and flexibility in the utilization of renewable energy sources.
Enable the delivery of renewable energy.

4.1.2 BLM's Need for Action

BLM's purposes in authorizing the proposed action, or an alternative, are the following:

Minimize adverse environmental effects to BLM managed lands, such as the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values.
Promote increased use of renewable energy and more efficient use of existing energy corridors, and designate new corridors to ease congestion.
Avoid or minimize impacts to Areas of Critical Environmental Concern (ACEC—an area where special management attention is required to *protect and prevent irreparable damage* to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards).

4.1.3 Forest Service's Need for Action

Pursuant to the Federal Land Policy and Management Act (FLPMA) of 1976 (as amended), the Forest Service's need for action is to respond to applications from LADWP for a Special Use authorization to construct, maintain, and use transmission lines (and ancillary improvements) through the Santa Clara/Mojave Rivers Ranger District of the Angeles National Forest. The Forest Service will consider the application for use of NFS (National Forest System) lands to ensure that the proposed action is in the public interest and is appropriate based on the governing land management plan. FLPMA provides the authority to the Secretary of Agriculture (Forest Service) to issue, renew, or grant authorizations to occupy, use, or traverse NFS lands for the generation, transmission, and distribution of electrical power (43 U.S.C. 1761).

The Forest Service's purposes in authorizing the proposed action, or an alternative, are the following:

Minimize adverse environmental effects to Natural Forest System lands, such as impacts to the following resources: visual, biological, cultural, recreation, air, soil, and water, among others as applicable (Forest Plan, Part 1, pp. 38 and 47; Part 2, pp. 7, 32, 35, 69, and 79);
Review the eligible San Francisquito Canyon as a Wild and Scenic River. If the proposed action could compromise the outstandingly remarkable value(s), potential classification, or free-flowing character of an eligible wild and scenic river segment, a suitability study will be completed for that eligible river segment prior to initiating activities (Forest Plan, Standard 59, Part 3, p. 13);
Minimize the effects of urbanization, or negative effects to open space and natural settings, on the Angeles National Forest (Forest Plan, Part 2, pp.35, 67-70);

Ensure that future Forest management activities such as wildland fire fighting, among others, are not detrimentally affected by the location and/or design of the proposed action (Region 5 Supplement FSM 2726.43; Forest Plan, Part 1, p. 19; Part 2, p. 37); and

Ensure that the location of the transmission line on NFS lands maximizes the accommodation of future utility needs (Forest Plan, Part 2, p. 121; Part 3, p. 59).

4.2 POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS

Per NEPA Regulations (40 C.F.R. Section 1500.2(e)), the NEPA process is used to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. CEQA Guidelines (Section 15126.6(b)) also state that the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

Through scoping, subsequent public involvement efforts, and preparation of preliminary technical reports, the following potentially significant issues were identified with the construction, operation and maintenance of the proposed BRRTP.

TABLE 3. SIGNIFICANT ISSUES OF THE BRRTP

RESOURCE	POTENTIAL SIGNIFICANT ISSUES
Biological Resources	Potential for adverse effects to rare, threatened, and endangered and special-status species. Considerable concern for Riparian Conservation Areas and the spread of noxious weeds throughout Angeles National Forest lands. Impacts to avian species and increased raptor predation of sensitive species due to the use of lattice towers. Potential for loss of habitat.
Cultural Resources	Impacts to historical, cultural and archaeological resources in the Project area.
Earth Resources	Adverse impacts to soils throughout the proposed Project area, including sedimentary rocks and fossils.
Water Resources	Impacts to drainages, wetlands, Waters of the State, Waters of the U.S., and blue-line streams.
Land Use	Acquisition of private property, eminent domain, and the expansion of transmission line right-of-way and easements. Decreased property values with additional transmission lines. Conflicts with land use and recreation policies of the Forest Plan.
Fire Management	Impacts to fire suppression efforts.
Recreation	Impacts to recreational facilities and trails. Impacts to the quality of the Antelope Valley California Poppy Reserve, Pacific Crest Trail, Wild and Scenic River Corridor, and wilderness.
Visual Resource	Adverse affects to visual resources of the area, especially those important to the character of the ridgelines, as well as from homes, communities, businesses, trails, State Parks, Angeles National Forest, BLM-managed lands, and other public lands.

4.3 FEASIBILITY

CEQA Guidelines (Section 15126.6(f)(1)) state that a number of factors may be considered in determining which alternatives are feasible. These include, but are not limited to, the following:

Suitability;
economic viability;

availability of infrastructure;
general plan consistency;
other plans or regulatory limitations;
jurisdictional boundaries; and
whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent).

According to NEPA's Forty Most Asked Questions No.2a, reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

4.4 RECOMMENDATION FOR ANALYSIS IN EIS/EIR

A number of alternatives to the proposed Project were identified, and some of these alternatives did not meet the purpose and need for the Project or provide the potential to avoid or minimize adverse environmental effects, or were considered infeasible through additional study and evaluation. A rationale for each alternative's ability to meet the criteria is provided in the following section, along with a recommendation for elimination or retention of the alternative for full analysis in the EIS/EIR.

5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED ANALYSIS

NEPA and CEQA require an EIS/EIR to consider a reasonable range of alternatives to the project that would feasibly attain most of the basic objectives of the project, but avoid or substantially lessen any adverse effects of the proposed project. The scoping process, informational public meetings, and preliminary studies identified fourteen alternatives for the proposed Project.

To determine which alternatives would be considered for full analysis in the EIS/EIR, the alternatives were categorized as system, design, or routing alternatives. A brief description of each alternative is provided, the alternative's ability to meet the screening criteria described in Section 4.0 is disclosed, and a rationale for the recommendation to retain or eliminate an alternative from full analysis in the EIS/EIR is provided.

5.1 SYSTEM ALTERNATIVES

5.1.1 Energy Conservation and Demand-Side Management

Alternative Description
This alternative would involve increased energy conservation and demand-side management within the LADWP service area instead of interconnecting to generation from the Tehachapi Mountains and Mojave Desert.

Energy conservation and demand-side management are currently an integral part of LADWP's strategy to meet customer needs. Energy-saving and efficiency efforts include the Consumer Rebate Program, the Refrigerator Exchange and Retire Program, Low Income Refrigerator Exchange Program, Trees for a Green LA, the Small Business Direct Install Program, and the Compact Fluorescent Light Bulb Delivery Program. This alternative would continue these existing programs and invest in expanding them.

Meeting the Purpose and Need
This alternative would generally reduce the need for additional power and could thus reduce greenhouse gas emissions, but would not assist in meeting the Renewable Portfolio Standard Goals or allow for the interconnection and expansion of LADWP's renewable energy in the Tehachapi Mountains and Mojave Desert. Nor would it increase system reliability and flexibility in the utilization of renewable resources or

enable the delivery of renewable energy. In 2007, Los Angeles Mayor Antonio Villaraigosa committed that power contracts from coal-fired plants would not be renewed and LADWP would secure other generation sources. Energy conservation and demand-side management alone will not meet the electrical demand.

Potential to Avoid and Minimize Environmental Effects
Energy conservation and demand-side management would decrease energy demand which, if other contributing factors such as population growth were static, given a static demand would decrease the need for power generation and transmission. Decreased power generation could lead to avoiding environmental impacts associated with power generation from existing facilities (e.g., to Air Quality, Water Resources, Hazards and Hazardous Materials) and avoid impacts associated with the development of new power facilities and transmission (e.g., to Biological Resources, Cultural Resources, Earth Resources, Water Resources, Land Use, Recreation, Visual Resources). This alternative would eliminate nearly all of the significant issues identified by not constructing, operating, or maintaining the BRRTP. However, it is assumed that if Barren Ridge were not built, other transmission projects with similar impacts may be proposed to meet the electrical demands, RPS goals, and greenhouse gas emission reductions.

Feasibility
Since 2000, LADWP has successfully implemented a number of conservation and energy efficiency programs and reduced peak load by approximately 176 MW. While energy conservation and demand-side management is feasible and may reduce electricity demand, the reductions alone are not sufficient to meet current and future electrical demands or RPS goals.

Recommendation for Analysis in EIS/EIR
ELIMINATION. Energy conservation and demand-side management alone will not meet the electrical energy demands, meet RPS goals, or achieve greenhouse gas emission reduction goals. While it could lead to avoidance and minimization of environmental effects from the construction of a new transmission line, it is not feasible to rely solely on this strategy to meet the electrical energy demands and meet RPS and greenhouse gas reduction goals.

5.1.2 Distributed Generation and In-basin Generation Expansion

Alternative Description
This alternative would involve the increased expansion of distributed generation, including solar facilities and fuel cells within the LADWP service area, and the development of additional large scale in-basin generation instead of interconnecting to generation from the Tehachapi Mountains and Mojave Desert. Distributed generation entails the installation of new small electrical generating plants, typically less than 20 megawatts, at or near electric load centers. New in-basin generation could include facilities such as new gas, biogas, small hydro-electric, solar, and geothermal power plants.

Increased distributed generation and small solar generation is already an integral part of LADWP's approach to meeting energy needs and RPS goals. Some of the programs that LADWP has implemented are the Distributed Generation Program, Customer Generation Rebate Program, and Residential Solar Initiative Program. In addition, LADWP has also recently upgraded a number of their generating stations to make them more efficient.

Meeting the Purpose and Need
To the extent that the new generation would be renewable in nature, this alternative could assist LADWP to meet RPS goals and reduce greenhouse gas emissions. The existing programs currently being implemented by LADWP have already been included within its projected RPS goals. These programs and

projects alone, however, will not meet the long-term RPS goals. It would not allow interconnection and expansion of LADWP's renewable energy in the Tehachapi Mountains and Mojave Desert, or delivery of renewable resources. System reliability and flexibility of the existing high-voltage transmission system would not increase. It would, however, minimize effects to ANF and BLM managed lands.

Potential to Avoid and Minimize Environmental Effects
New sources of in-basin generation would avoid impacts associated with the proposed Project, but would also result in site-specific impacts associated with the construction and installation of new distributed solar facilities, gas, hydro-electric, solar and/or geothermal power plants, including impacts to air quality, biological resources, cultural resources, land use, noise, traffic, transportation, socioeconomics, and visual resources. Electrical transmission upgrades would also be required to integrate these new resources into the transmission system, and although their locations and specific impacts are unknown, it is assumed that impacts of additional transmission and generation projects would be similar enough to BRRTP that they may, on balance, cancel any environmental benefits of this alternative.

Feasibility
Building distributed generation and expansion of in-basin generation resources is feasible.

Recommendation for Analysis in EIS/EIR
ELIMINATION. LADWP has implemented a number of distributed generation and in-basin generation programs. This alternative alone will not meet the electrical energy demands, meet RPS goals, achieve greenhouse gas emission reduction, or increase overall system reliability, nor would it provide delivery of renewable energy at a level and within a timeframe necessary to meet purpose and need.

5.1.3 Solar Alternative

Alternative Description
The solar alternative would involve the increased use of solar energy. LADWP has a Solar Energy Plan that consists of the following five programs that are mainly in the Los Angeles Basin:

(1) The Solar Incentive Program (SIP), which encourages LADWP ratepayers to install solar panels on their roofs. The goal is to install 130 MW of customer-owned solar systems by 2020;

(2) Feed-in Tariff (FiT) would allow a solar developer in the City of Los Angeles to sell wholesale power directly to LADWP through a long-term contract between the private seller and LADWP. The goal is to obtain 150 MW of solar power from developers by 2016;

(3) The new SunShares Program would provide residential customers the opportunity to invest in an LADWP solar power plant. The goal is to obtain approximately 100 MW of solar power from a SunShares power plant by 2020;

(4) The Utility Built (LADWP-owned Solar Projects) program would involve the installation of solar systems on LADWP-owned rooftops, reservoirs and parking lots. LADWP has a goal of obtaining 400 MW of solar power from City-owned systems by 2014; and

(5) The Large-Scale Solar Program would involve LADWP procuring large-scale power purchase agreements from third-party solar developers. LADWP has a goal of obtaining 500 MW of utility-scale solar power from developers in the Mojave Desert by 2020.

The Solar Incentive Program, SunShares, and Feed-in-Tariff programs would be within the Los Angeles Basin. The Utility Built program would be mostly in-basin as well. The Large-Scale Solar Program (or power purchase agreements) would largely be out-of-basin in order to access solar resources in the Mojave Desert and require transmission to the City of Los Angeles.

Meeting the Purpose and Need
The increased utilization of solar energy would provide LADWP with approximately 10% of its RPS goals and would reduce greenhouse gas emissions. However, the solar programs alone would not meet LADWP's RPS goal of 35% by 2020. System reliability and flexibility of the existing high-voltage transmission system would not increase. Without the construction of a new 230 kV transmission line from Barren Ridge to Haskell Canyon, the delivery of solar energy from the Mojave Desert area would be limited.

Potential to Avoid and Minimize Environmental Effects
In-basin solar generation would avoid the need to construct a new 230 kV transmission line and reconductor an existing transmission line. However, the Large-Scale Solar Program and Solar Incentive Program may result in site-specific impacts associated with the construction and installation of new solar facilities and require electrical transmission upgrades to integrate these new resources into LADWP's electrical system.

Feasibility
Accessing solar energy is feasible, as evidenced by the solar program proposals by LADWP listed above.

Recommendation for Analysis in EIS/EIR
ELIMINATION. LADWP currently has a Solar Energy Plan that proposes a number of solar programs that would provide approximately 10% of LADWP's electrical demand. Although this alternative may avoid or minimize impacts of the proposed Project, this alternative alone would not meet the electrical energy demands or RPS goals. Additional transmission capacity may also be required to transfer solar energy from the Large-Scale Solar Program in the Mojave Desert area to the Los Angeles Basin.

5.1.4 Reconductor Existing Transmission Line (No New Transmission Line)

Alternative Description
To minimize impacts of a new transmission line and right-of-way expansion, LADWP considered an alternative that would upgrade the existing electrical system. This alternative would have all the same project components as the Proposed Project (reconductoring the existing BR-RIN transmission line, addition of a new 230 kV circuit on existing structures, construction of Haskell Canyon Switching Station, and expansion of Barren Ridge Switching Station), except the construction of a new double-circuit 230 kV transmission line from the Barren Ridge Switching Station to the proposed Haskell Switching Station.

The BR-RIN's existing conductors would be replaced with a 1,433.6 kcmil "Merrimack" ACSS/TW/HS (aluminum conductor steel supported/trapezoidal wires/high strength). A new circuit, consisting of a bundled 715.5 kcmil "Starling" ACSS/AW conductor, would be placed onto existing structures from the Castaic Power Plant to the proposed Haskell Canyon Switching Station.

Reconductoring of the existing BR-RIN transmission line would take approximately one year and would require the transmission line to be taken out of service. However, north of Barren Ridge Switching Station, seven LADWP hydroelectric power plants along the Los Angeles Aqueduct transmit their electrical energy output onto the BR-RIN transmission line. The power plants do not have by-pass capabilities and are required to generate energy to avoid deterioration to the electrical turbines. Therefore, since there is no means for bypassing the power plants or halting the electrical output, a temporary transmission line would be required in order to reconductor the existing BR-RIN transmission line between Barren Ridge and Haskell Canyon. This temporary transmission line, sometimes referred to as a shoe-fly, would typically consist of temporary wood poles used to carry the existing energized conductors along the entire stretch of the BR-RIN corridor. Construction of the temporary shoe-fly would require approximately 80 – 100 feet of temporary right-of-way adjacent to the existing BR-RIN line. The construction would require surveying of right-of-way, rehabilitation of existing access and spur roads, clearing of right-of-way where necessary, installation of temporary poles, conductor relocation and installation, and cleanup.

To the maximum extent possible, the same access and spur roads utilized for the construction of a temporary shoe-fly would be also be utilized for the reconductoring of the BR-RIN. To carry the additional weight of the new heavier conductor, some existing BR-RIN towers may require modification, replacement, or foundation reinforcement. The existing conductor would be used as a pulling line for the new conductor. Once the transmission line is reconductored and in service, the temporary shoe-fly would be removed.

The addition of a new circuit from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would require surveying of right-of-way, rehabilitation of existing access and spur roads, clearing of right-of-way where necessary, installation of conductor, and cleanup. All work would occur within the existing right-of-way.

The new proposed Haskell Canyon Switching Station and expansion of the Barren Ridge Switching Station would be located on LADWP-owned land. The construction of a new switching station and expansion of the existing switching station would require the following activities: preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, installation of electrical equipment, and installation of control and relay houses.

Meeting the Purpose and Need
The existing BR-RIN transfers approximately 110 MW of hydropower. In the mountains northeast of Tehachapi, LADWP has two wind projects (Pine Tree, which has recently completed construction, and the proposed Pine Canyon) that would total 270 MW. The power generated from these wind projects will be transferred through the BR-RIN transmission line, thus creating a total generation transfer of 380 MW. Even with the increased capacity from reconductoring, the upgraded transmission line would not be sufficient to deliver future renewable energy from the Tehachapi Mountains and Mojave Desert areas.

Without the construction of a new double-circuit 230 kV transmission line, the amount of renewable energy transferred from the Tehachapi Mountains and Mojave Desert areas to the Los Angeles basin would be very limited Also, any disruption of service along the reconductored transmission line would crease transmission of renewable energy from the Project Area. The existing Pacific Direct Current Intertie is adjacent to the BR-RIN; however, it operates as a bipolar direct current 500 kV transmission line and it is very difficult for renewable resources to tap into and interconnect.

Limiting LADWP's ability transfer renewable energy would also limit its ability to reduce greenhouse gas emissions, meet RPS goals, ensure reliability and flexibility in the utilization of renewable energy sources, and conduct interconnections and expansion of renewable energy sources. Elimination of the new transmission line would minimize long-term permanent impacts to federal lands managed by the

BLM and USFS. However, this alternative would not maximize the accommodation of future utility needs, nor would it increase system reliability along the Barren Ridge to Haskell Canyon utility corridor.

Potential to Avoid and Minimize Environmental Effects
The reconductoring of the existing BR-RIN and addition of a new circuit between Castaic and Haskell Canyon would maximize the use of existing right-of-way and minimize the permanent acquisition of private property. It would also minimize potential permanent impacts to lands federally managed by the BLM and USFS. The construction of a temporary shoe-fly would likely have less impact than the addition of a new double-circuit transmission line, due to its temporary nature and because the footprint of the shoe-fly is smaller than that of a double-circuit tower. However, the removal of the temporary towers would also contribute to temporary disturbance. It is assumed that if the new Barren Ridge-Haskell Canyon double-circuit transmission line were not built, other transmission projects with similar impacts to the proposed Project would be proposed by LADWP to meet the future electrical demands, RPS goals, and greenhouse gas emission reductions goals. Therefore, environmental impacts may not be minimized without the construction of a new transmission line.

Feasibility
This alternative is feasible.

Recommendation for Analysis in EIS/EIR
ELIMINATION. Without a new double-circuit 230 kV transmission line, the transfer capacity of the utility corridor from Barren Ridge to the proposed Haskell Canyon Switching Station would be constrained, thereby limiting LADWP's ability to deliver renewable energy, meet future electrical demands, RPS goals, greenhouse gas reductions goals, and interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas. The permanent impacts of this alternative would be less than that of the proposed Project; however, the construction of a temporary shoe-fly and need for additional transmission capacity would not minimize or avoid impacts to environmental resources.

5.1.5 New 230 kV Transmission Line (No Reconductoring of BR-RIN)

Alternative Description
Another variation of the proposed Project would be the construction of four of the five proposed Project components. This alternative would eliminate the reconductoring of the existing BR-RIN transmission line. This alternative would include construction of a new 230 kV double-circuit transmission line from Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station, addition of a new 230 kV circuit on existing structures from the Castaic Power Plant to the proposed Haskell Canyon Switching Station, construction of the Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station.

Construction of the new transmission line would require a 200 foot right-of-way and involve the following general sequence of events: surveying the centerline; identifying and constructing access roads; clearing right-of-way and tower sites (including construction yards and batch plants); installing foundations; assembling and installing the towers; clearing, pulling, tensioning, and splicing sites; installing ground wires and conductors; installing counterpoise/ground rods; and cleanup and site reclamation.

The addition of a new circuit between Castaic and Haskell Canyon would require surveying of right-of-way, rehabilitation of existing access and spur roads, clearing of right-of-way, installation of conductors, and cleanup. All work would occur within existing right-of-way.

The construction of the new proposed Haskell Canyon Switching Station and expansion of the existing Barren Ridge Switching Station would require the following activities: preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, installation of electrical equipment, and installation of control and relay houses.

Meeting the Purpose and Need

The construction of a new double-circuit transmission line, installation of a new circuit, construction of a new switching station, and expansion of the existing switching station would increase transmission of renewable energy from the Tehachapi Mountains and Mojave Desert areas to the Los Angeles Basin. However, without reconductoring the existing BR-RIN, LADWP would be limited by its ability to transfer renewable energy to the Los Angeles Basin and meet projected future electrical demands. Removing the reconductoring component would also limit LADWP's ability to meet RPS and greenhouse gas reduction goals.

Utility companies must provide a reliable system and therefore must plan for disruptions in service. In the event that a transmission line was out of service, referred to as an N-1 situation, the energy would be transferred to adjacent transmission lines. Generally, planning for an N-1 situation takes into account the loss of the largest line within a corridor. Therefore, the lowest-capacity transmission line within a corridor would become the limiting factor. Reconductoring the existing BR-RIN transmission line would reduce the potential of the two new Barren Ridge-Haskell Canyon circuits' transfer capacity significantly in order to avoid the overloading of the BR-RIN transmission line in an N-1 scenario. This alternative would also reduce the potential transmission capacity of the entire corridor between Barren Ridge and Haskell Canyon.

The elimination of the reconductoring component of the proposed Project would minimize impacts to federal lands managed by the BLM and USFS. However, it may not meet LADWP's future electrical demands related to meeting RPS goals.

Potential to Avoid and Minimize Environmental Effects

Removal of the reconductoring component of the Project would minimize environmental impacts to air quality, biological resources, cultural resources, traffic and transportation, and water resources. It would also reduce cumulative impacts of the proposed Project.

Feasibility

Construction of the proposed project, minus reconductoring of the existing BR-RIN is feasible to construct.

Recommendation for Analysis in EIS/EIR

ELIMINATION. This alternative would allow LADWP to access renewable resources in the Tehachapi Mountains and Mojave Desert areas. By removing the reconductoring portion of the proposed Project, it would minimize the potential for impacts to environmental resources and reduce cumulative impacts of the proposed Project. However, it would limit LADWP's ability to transfer renewable energy, meet future electrical energy demands, meet RPS goals, and reduce greenhouse gas emissions.

5.2 DESIGN ALTERNATIVES

5.2.1 Direct Current Transmission

Alternative Description

This alternative would utilize direct current (DC) for power transmission rather than alternating current (AC). DC conductors can transfer approximately twice the power than the proposed AC conductors and may also allow power transmission between unsynchronized AC distribution systems. This increases system stability by preventing cascading failures from propagating within a wider power transmission grid. The magnitude and direction of power flow through a DC transmission line can be directly commanded, and changed as needed to support the AC networks at either end of the DC link.

LADWP's existing transmission network contains both AC and DC transmission. Parallel to the BR-RIN is the existing ±500 kV Pacific Direct Current Intertie (PDCI) that utilizes direct current technology. The PDCI is operating at capacity and cannot accommodate additional energy. In order to fully incorporate a new DC line into the existing AC system, conversion facilities would have to be built at the terminal ends (Barren Ridge Switching Station and the proposed Haskell Canyon Switching Station). The converter stations would be approximately 30 acres and include an inverter, three-phase alternating current switchgear, transformers, capacitors or synchronous condensers, filers for harmonics, and direct current switchgear.

The DC conductors have the ability to transfer a greater capacity than AC conductors. Therefore, in this alternative a new DC line would replace the proposed double-circuit 230 kV transmission line and existing BR-RIN. The DC towers would require similar right-of-way, tower heights, footprints, and tower-to-tower spans as that of the proposed 230 kV transmission line. The main difference would be that the DC system would also require two-phase conductors versus the three-phase conductors of an AC system.

The construction sequence of a DC transmission line would be very similar to that of a new AC transmission line. Once the new DC line was constructed, the existing BR-RIN 230 kV transmission line would be removed.

DC Technology

Technological advances within the last decade have made High Voltage Direct Current (HVDC) transmission more economically feasible and advantageous. Conventional HVDC utilizes Current-Source Converters (CSC) to rectify or invert power from AC to DC and back to AC. New technology uses what is known as Voltage-Source Converters (VSC). Typically, using VSC technology results in a much reduced converter station size when compared to conventional CSC systems. This generation technology is referred to as HVDC Light or HVDC Plus. To date, HVDC Light or HVDC Plus technology has seen limited application for power transfer levels up to about 1,000 MW and 150 kV DC.

The conventional CSC stations required at each end of the HVDC line would house the HVDC equipment in large buildings with open air AC line terminal equipment. The converter stations are estimated to encompass an area approximately 2,000 feet by 1,200 feet with structures and buildings 75 to 90 feet tall. Typical High Voltage Alternating Current (HVAC) stations would occupy approximately 500 feet by 500 feet for a double-circuit 230 kV line. Due to greater long-term impacts associated with the larger HVDC converter stations (e.g., visually more obtrusive and greater permanent land disturbance), HVAC would be the preferred technology for this Project because it requires smaller transition stations.

Meeting the Purpose and Need

As this alternative would involve the construction of a transmission line that would convey the same amount of power as the proposed action, it would meet much of the action's basic purpose and need to deliver renewable energy, meet electrical energy demands, and increase system reliability and flexibility. However, due to the high cost of interconnections and the need for converter stations at Barren Ridge and Haskell Canyon, constructing a DC system could potentially limit connection to future wind and solar facilities that may be developed in the area. The ability to transmit a greater amount of power on one transmission line versus two transmission lines in the proposed action would minimize impacts to federal lands managed by the BLM and USFS.

Potential to Avoid and Minimize Environmental Effects
The primary construction impacts for a transmission line are very similar for overhead AC and DC transmission lines. However, the DC conductor has the ability to transfer a greater amount of power than the proposed AC conductors and therefore could transmit the power on one transmission line, rather than the proposed two AC transmission lines (new double-circuit and existing BR-RIN). The DC transmission line would have a smaller footprint and require less right-of-way than the proposed Project and, therefore, would minimize long-term impacts to environmental resources, especially land use, visual resources, and air quality. However, impacts associated with the removal of the existing BR-RIN transmission line would be similar to that of reconductoring this same transmission line as proposed by the proposed action.

The terminal converter stations required for a DC transmission line would be approximately 30 acres each, which is significantly larger than the proposed new Haskell Canyon Switching Station and expansion of the existing Barren Ridge Switching Station (approximately five acres each). The construction of the converter stations would increase the potential for impacts to air quality, land use, biological resources, cultural resources, earth resources, water resources, and visual resources.

Feasibility
DC transmission systems generally are considered less expensive and suffer lower electrical losses than AC systems for very long distance transmission lines (typically 400 miles or more). However, the considerably higher cost of DC conversion equipment (terminal stations that convert DC to AC, and vice versa) and decreased efficiency over shorter distances compared to an AC system make AC transmission generally preferable. LADWP is proposing a new 60 mile 230 kV transmission line and DC transmission is rarely suitable for projects of this voltage and length.

DC transmission systems are typically point-to-point transmission systems, and "tapping" DC systems with interconnections of solar and wind generation within the Mojave and Tehachapi areas to create a multi-terminal DC system is technically and economically not feasible; furthermore, tapping into the middle of such a line is generally considered non-viable. AC systems allow for more flexibility with these interconnections of renewable power sources.

AC is preferable because it has a shorter construction schedule and substantially lower costs, and would allow more flexibility for future connections to other systems. The costs to construct the converter stations for a new DC line would be significantly more than the proposed Project, and would also take significantly more time to construct than a typical AC switching station. Without clearly demonstrated benefits, LADWP would be unable to justify the considerably greater costs associated with this alternative.

Recommendation for Analysis in EIS/EIR
ELIMINATION. The DC system would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. Although this alternative would minimize the number of transmission line towers and reduce the need for right-of-way, converter stations would be required that may increase the potential for impacts to air quality, land use, biological resources, earth resources, water resources, and visual resources. The

DC system is a point-to-point system, and tapping into it to create a multi-terminal system is technically and economically not feasible and therefore may limit the future interconnections into the system and the amount of renewable energy available for LADWP in meeting RPS goals. The converter stations also come at considerably higher costs without clear benefits as compared to an AC system, and therefore make this alternative infeasible for LADWP.

5.2.2 Quad-Circuit Towers

Alternative Description

LADWP considered the use of quad-circuit towers along the existing BR-RIN corridor instead of the proposed double-circuit tower and existing BR-RIN towers. The towers would be constructed adjacent to the existing transmission towers within new right-of-way and would require a 50 foot by 40 foot tower footprint, and be approximately 120 feet in height, with tower-to-tower spans of 1,000 ft (which is very similar to that of the proposed double-circuit towers). The reconductored BR-RIN circuit and two new proposed circuits would be combined onto the same quad-circuit towers. Once the quad-circuit towers were constructed with the two new circuits, the new BR-RIN conductor would be transferred onto the new quad-circuit towers, and the existing BR-RIN towers would be removed. One position on the new towers would remain vacant for a possible future circuit. The quad-circuit towers would reduce the number of towers and reduce right-of-way needs by approximately 65 feet in comparison to the Proposed Action, which would require 200 feet of new right-of-way.

LADWP does not have existing 230 kV transmission lines along Segments C, D, E, F, H, and I, and therefore the use of quad-circuit towers would not be considered along these corridors. The new quad-circuit towers would be constructed adjacent to the existing ±500 kV PDCI and require an additional 135 foot right-of-way.

A portion of the BR-RIN conductors, from Power Plant #2 to Haskell Canyon, are hung on existing quad-circuit towers. To accommodate the weight of the proposed new Barren Ridge to Haskell Canyon transmission line (two circuits) and the reconductored BR-RIN, the existing towers would need to be raised approximately 20 feet. To avoid an interruption of service along the BR-RIN, a temporary shoe-fly would need to be constructed, which would require a temporary 80-100 foot right-of-way.

After the construction of the new quad-circuit towers, the existing BR-RIN conductor would be transferred onto the new quad-circuit towers and the shoe-fly and existing BR-RIN tower would be removed.

Meeting the Purpose and Need

The reduction of transmission line towers and right-of-way expansion would meet BLM's and Forest Service's purposes of minimizing the effects of utility corridors on federally managed lands. However, LADWP is interconnected into the Western Grid and follows the Western Electricity Coordinating Council (WECC) and the North American Electric Reliability Corporation (NERC) standards for system reliability criteria. In the event of a structure loss, the placement of multiple circuits on single structures would lessen reliability by increasing potential for loss of multiple circuits. This alternative would include all three circuits on a single structure for the entire length of the transmission line from Barren Ridge to Haskell Canyon. WECC regulations would limit the transfer capacity on the towers and, therefore, a limited amount of renewable energy would be transmitted in comparison to the proposed action. This would limit LADWP's greenhouse gas emission reduction, along with the ability to meet RPS goals and electrical demands.

Potential to Avoid and Minimize Environmental Effects
Construction of a new multi-circuit tower and the removal of the existing BR-RIN would have similar temporary impacts to biological resources, recreation, and visual resources. However, the use of multi-circuit towers would minimize the right-of-way needs and eliminate existing structures by combining circuits onto one tower and, therefore, would minimize permanent impacts to land use and visual resources. The elimination of existing towers and placement of conductors from both existing and new lines onto single structures would minimize permanent impacts to visual resources.

Feasibility
Construction of multi-circuit towers is feasible.

Recommendation for Analysis in EIS/EIR
ELIMINATION. Although this alternative would require less permanent right-of-way and minimize permanent impacts to visual resources and to Forest Service- and BLM-managed lands, it would increase land use impacts. The multi-circuit structures would not meet the purpose and need to increase LADWP's system reliability and flexibility, increase delivery of renewable energy, or meet future electrical demands. It would also limit LADWP's ability to reduce greenhouse gas emissions, meet RPS goals, and allow interconnection and expansion of renewable energy resources. Greater temporary impacts would result to construct the large quad-circuit towers and remove the existing BR-RIN.

5.2.3 Alternative Voltages

Alternative Description
The voltage of a transmission line determines the line's ability to transmit electricity. The resistive power loss of a transmission line can be reduced by increasing the operating voltage of a transmission line. Long-distance transmission is most economically served at high voltages. In general, as the voltage increases, the height of the supporting towers, footprint of the towers, size of the insulators, distance between conductors on a towers, and right-of-way widths increase.

A single-circuit 500 kV transmission line tower structure would be an average height of 150 feet, and require a 50 foot square footprint and approximately 200 foot wide right-of-way. The ability to transfer a greater capacity would allow LADWP to transfer energy onto one tower instead of reconductoring the BR-RIN and building a new 230 kV transmission line. The existing BR-RIN would be removed upon completion of the new 500 kV transmission line.

The existing Barren Ridge and proposed Haskell Canyon Switching Stations would need to be converted into substations and would require the incorporation of transformers and a 500 kV switchyard (approximately 600 feet by 600 feet). This would increase the size of the Barren Ridge and Haskell Canyon 500/230 kV Substations to be approximately 1,000 feet by 600 feet each.

To avoid additional impacts, the two sets of existing 230 kV transmission line towers located in the Castaic Transmission Corridor would remain and would not be upgraded to a 500 kV transmission line. Similar to the proposed Project, this alternative would also include the addition of a new circuit on existing structures.

The 500 kV double-circuit transmission line has the potential to increase environmental impacts and deliver a capacity well beyond the needs of LADWP, and is therefore not considered. Lower voltage lines, such as double-circuit 115 kV or 69 kV transmission lines, have lower transfer capacities; they do not have the power transfer capability as the proposed Project and are therefore not considered for the proposed Project.

Meeting the Purpose and Need

The single-circuit 500 kV transmission line is capable of delivering the capacity required for the BRRTP and would meet the purpose and need of the Project. It would reduce greenhouse gas emissions, meet RPS goals, enable delivery of renewable energy, increase reliability and flexibility in the utilization of renewable energy sources, and increase the use of existing energy corridors.

Potential to Avoid and Minimize Environmental Effects

The 500 kV transmission line has the potential to minimize visual and land use impacts, because it has the ability to transfer a greater amount of power on one transmission line instead of two transmission lines in the proposed Project (new 230 kV double-circuit transmission line and reconductored BR-RIN). Although the towers would be slightly taller and have a larger footprint, this alternative would require fewer towers than the proposed Project.

However, the conversion of the switching stations into 500/230 kV substations would more than double the proposed size of the stations and increase the potential for impacts to air resources, biological resources, cultural resources, earth resources, land use, water resources, and visual resources.

Feasibility

LADWP facilities within the Project area, including the Castaic Power Plant, currently operate at 230 kV. Utilization of an alternative voltage would require significant upgrades, expansion, and modifications to the existing Barren Ridge Switching Station. The proposed Haskell Canyon Switching Station would instead become a significantly larger substation. The feasibility of constructing such a large substation within Haskell Canyon, or in close proximity, would be very challenging. LADWP estimates upgrading of the substations would add significant cost and time to construct.

Recommendation for Analysis in EIS/EIR

ELIMINATION. The use of an alternative single-circuit 500 kV transmission line would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS, greenhouse gas reduction goals, and electrical energy demands. However, it may not be feasible to construct a 500/230 kV substation within Haskell Canyon. The increased footprint of the substations also has the potential to increase environmental impacts.

5.2.4 Underground Transmission

Alternative Description

This alternative would use existing technology to install the transmission line underground, instead of conventional construction using steel towers and overhead conductors. Underground transmission systems in the United States are generally used in urban areas for lower-voltage distribution lines. High voltage (115 kV and above), short distance, underground installations have been constructed where overhead lines were not feasible (e.g., in the vicinity of airports, urban centers).

The construction of underground transmission lines requires grading and clearing of trees and vegetation along the right-of-way prior to excavation of the entire length of the transmission line. Large areas of disturbance would result from the excavation and associated activities, such as heavy equipment use and soil storage. Underground construction is more difficult and results in greater clearing, grading, and land disturbance than overhead transmission line construction.

The land required for operation and maintenance of underground transmission lines must remain free of secondary surface development or lengthy-rooted trees planted along the line route, and only vegetation that will not cause maintenance problems is permitted above the underground route throughout the life of the proposed Project. This contributes to a land use similar to that of a secondary road. Also, duct banks, fluid reservoirs, stop joints, and/or retaining vaults are required for certain underground technologies, increasing the need for cleared land and continued all-weather access for operation and maintenance.

The installation of an underground transmission line would require more time than for construction of an equivalent length of overhead line because of the time required for excavating trenches and constructing the duct banks, fluid reservoirs, and/or stop joints, and the limitations on times of the year available for construction, which would be chosen to limit the impacts to the environment.

AC or DC Technology

Similar to overhead lines, underground transmission lines can be installed using AC or DC technology. Underground transmission lines can utilize either High Voltage Alternating Current (HVAC) or High Voltage Direct Current (HVDC). The primary differences between these two technologies are that HVDC would consist of two DC conductor positions, referred to as "poles," instead of three AC conductor positions, referred to as "phases." Because HVDC utilizes two poles and HVAC utilizes three phases, HVDC would utilize two-thirds of the cables necessary for a HVAC system; however, HVDC would require AC/DC converter stations at each end of any underground segment (similar to what was described in section 5.2.3).

Technological advances within the last decade have made HVDC transmission more economically feasible and advantageous. Conventional HVDC utilizes Current-Source Converters (CSC) to rectify or invert power from AC to DC and back to AC. New technology uses what is known as Voltage-Source Converters (VSC). Typically, using VSC technology results in a much reduced converter station size when compared to conventional CSC systems. This generation technology is referred to as HVDC Light or HVDC Plus. To date, HVDC Light or HVDC Plus technology has seen limited application for power transfer levels up to about 1,000 MW and 150 kV DC.

The conventional CSC stations required at each end of the HVDC line would house the HVDC equipment in large buildings with open air AC line terminal equipment. The converter stations are estimated to encompass an area approximately 2,000 feet by 1,200 feet with structures and buildings 75 to 90 feet tall. Typical HVAC stations would occupy approximately 500 feet by 500 feet for a double-circuit 230 kV line. Due to greater long-term impacts associated with the larger HVDC converter stations (e.g., visually more obtrusive and greater permanent land disturbance), HVAC would be the preferred technology for this Project because it requires smaller transition stations.

Underground Technologies

High-voltage underground transmission lines have markedly different technological requirements than lower-voltage underground distribution lines. The components of a typical solid dielectric cable consist of a stranded copper or aluminum conductor, conductor shield, solid dielectric insulation, insulation shield, moisture barrier sheath, and a protective jacket. The conductors would be several inches in diameter, depending on voltage. Switch stations are often required on underground transmission systems to control the circuit voltage, depending on length and voltage class.

There are four typical underground technologies for high voltage transmission lines:

1. *Self-Contained Fluid-Filled (SCFF)*

The self-contained cable system consists of three individual phases, each contained within a hermetically sealed metallic sheath that is typically extruded lead-alloy or aluminum. The cables are insulated with a high-quality taped insulation. Both kraft paper and laminated paper-polypropylene insulations are employed. The fluid pressure necessary to prevent ionization is maintained through a hollow core in the center of the conductor. The SCFF cable is pressurized with a dielectric liquid at 575 pound-force per square inch gauge (psig) (35-520 kilopascal [kPa]). Commercial installations have pressures as high as 400 psig (2760 kPa) using reinforced sheaths. Small liquid reservoirs are placed along the route.

The presence of the dielectric liquid and reservoirs, plus the complexity of sheath bonding, are disadvantages of the SCFF cable system. SCFF cables may be directly buried, or they may be installed in ducts or in tunnels. An advantage of SCFF insulation cables compared to extruded-dielectric cables is that the insulation is thinner for the same conductor size and voltage class. This allows longer cable lengths on the same reel size and, in some instances, can provide the opportunity to install 230- to 275-kV-class cables into existing five-inch (125-mm) ID ducts.

2. *High-Pressure Fluid-Filled (HPFF) Cables*

A high-pressure fluid-filled (HPFF) cable system contains a pipe that is pressurized, usually with a dielectric liquid. Pipe-type cables have the three cable phases insulated with tapes of kraft paper or laminated paper polypropylene and installed in a common steel pipe. The three phases making up a line are pulled together into a previously installed coated and cathodically protected steel pipe, with distances commonly 3000 feet (980 m) between splices for 345 kV cables. After the entire line is installed, including splices and terminations, and the pipe welding is completed, the line is evacuated, then filled with a dielectric liquid. The liquid is pressurized to a nominal 200 psig (1380 kPa) using a pressurizing plant that also has a reservoir tank to accept volume changes due to system thermal expansion and contraction, as well as pumps, controls, and alarm systems. The presence of the dielectric liquid and need for a pressurizing plant must be taken into account for the HPFF cable system, but those considerations do not exist with a high-pressure gas-filled cable system.

Pipe-type cables have been the most commonly used transmission cable type in North America through the early twenty-first century for several major reasons:

- The pipe provides rugged protection against third-party damage.
- The system is reliable.
- The pipe can be installed in relatively short street openings, minimizing traffic disruption in crowded urban areas, and it can generally be installed more quickly than a concrete-encased duct bank.
- The dielectric liquid provides several options for cooling to improve the circuit rating.
- The laminated paper-polypropylene (LPP) insulation has a higher electrical strength and lower dielectric losses than kraft paper—its higher power transfer has permitted 345 kV cables to be installed in a nominal 8-inch (20-cm) pipe rather than a nominal 10-inch (25-cm) pipe used for 345 kV kraft paper insulated systems. The smaller pipe has many advantages, including cost, bending radii, trench size, and amount of dielectric liquid. Most newly installed 345 kV HPFF cable is now insulated with LPP, and it is used for many 230 kV and some 138 kV installations.

3. Gas-Insulated Lines (GIL) Transmission Cables

Gas-insulated lines (GIL) have been used in a few applications where high-power capabilities are required, such as in substation ties and through tunnels. The GIL system is inherently simple. The conductor and enclosure are made of aluminum tubing, cast-epoxy-resin spacers hold the conductor in place, and the gas gap insulation is typically SF_6 (sulfur hexafluoride) gas pressurized to 30-90 psig (200-600 kPa) or more recently a mixture of 90% nitrogen and 10% SF_6 at a higher pressure. The cable is supplied in rigid 40- to 60-foot (12- to 18-m) sections. Field joints are made between each section. There is minimal service experience in buried installations. The GIL system is normally installed aboveground or in underground troughs or tunnels. GIL are more costly than other cable types and have not yet been applied to long transmission lines.

Terminations consist of a cast resin insulator interfacing with SF_6-insulated switchgear bus bar or a porcelain shell similar in appearance to a conventional pothead. Internal stress control generally requires only a horn-shaped electrical grading shield in the shell. The same gas that pressurizes the bus also pressurizes the porcelain. Insulators for GIL cables are subject to distortion of the stress distribution through accumulation of space charge and particulate contamination, although manufacturers have developed particle traps to control contaminants. Since SF_6 is considered a greenhouse gas, care must be taken to minimize any leakage from the GIL system, hence the development of the 90% N_2, 10% SF_6 mixture.

4. Solid Dielectric (XLPE) Transmission Cables

Extruded-dielectric cables, also known as solid-dielectric cables, use crosslinked polyethylene (XLPE) insulation. XLPE cables are characterized by very small dielectric losses relative to paper and/or ethylene-propylene rubber cables. These losses are essentially constant up to emergency operating temperatures, in contrast to impregnated paper-insulated cables where dielectric losses can increase substantially at high temperatures.

At transmission voltages, the low dielectric loss of XLPE cables results in important improvements in ampacity and offers an additional safety factor against thermal runaway. Thermal runaway is the condition where a cable temperature increases, causing an increase in electrical losses that further raises the temperature, causing additional losses until the cable overheats and fails. The extruded-dielectric cable's lower capacitance extends the critical line length (the length at which all current-carrying capacity is required to supply charging current) significantly and does not contribute as severely to overvoltage problems on weak transmission systems.

Extruded-dielectric cable installations are commonly used in duct banks, one cable per duct, because direct burial and tunnel installations have not proven feasible in city streets. Extruded-dielectric cables are considered less complicated in terms of installation and accessories than SCFF or pipe-type cables, but the sheath bonding/grounding system can be complex, as with SCFF cables.

XPLE technology is considered to be the preferred technology due to reduced and simplified operational and maintenance requirements. Although all underground construction requires similar techniques and results in similar impacts, the discussion below focuses primarily on the use of XLPE technology, as this would be the most likely technology to be utilized for a 230 kV transmission project like the BRRTP.

In addition to the reliability issues associated with the use of newer underground technologies, seismic considerations, slope considerations, and cost are also examined when designing an underground transmission line.

Underground Installation

Underground lines can be installed by direct bury or trenching methods.

Direct Bury

A direct buried cable installation is where the cable is laid into an open trench. The trench is backfilled directly over the cables with native soils or thermal backfill material. Concrete caps are placed over the cables to provide mechanical protection. Direct buried cable installations should only be employed in areas where future excavations are not likely, such as within a fenced boundary, inside electrical substations, or within commercial or industrial private property. Direct buried installations are not practical in locations such as existing road rights-of-way where numerous utilities or service laterals are being crossed, or where future underground utility installations are expected.

Trenching

Trenching to install the underground duct banks would commence after identification of all underground utilities along the proposed underground alignments. Actions to accomplish this would include notifying all applicable utilities via underground service alert to locate and mark existing utilities, and conducting exploratory excavations (potholing) as necessary to verify the location of existing utilities. If required, encroachment permits would be secured for trenching in public streets.

Two trenches, separated by 20 feet, would be excavated for the double-circuit 230 kV underground transmission line. The majority of the underground duct banks would be installed in a 2x2 or 3x3 duct configuration, depending on the electrical loading criteria, using open-cut trenching techniques. A duct bank configuration would generally place the three individual phase cables of the circuit in a pyramid, with two cables on the bottom and one cable stacked on top and separated by spacers. As loading requirements for the circuit increase, additional cables may be necessary, in which case the number would be increased in increments of three.

Trenching would be staged so that open trench lengths would not exceed that required to install the duct banks. A maximum of 300 to 500 feet would be open at one time at any one location, depending on applicable permit requirements. Where needed, open trench sections that are not under active construction would have steel plates placed over them in order to maintain vehicular and pedestrian traffic.

Provisions for emergency vehicle access would be arranged with local jurisdictions in advance of construction activities. Should groundwater be encountered, it would be pumped into a tank for disposal in accordance with Project permits.

Excavated materials not temporarily stored to use for backfill would be hauled offsite to a materials storage yard. Based on the anticipated rate of construction progress (300 to 500 feet open at one time), approximately 400 cubic yards of excavated material would be hauled away per day. Excavated materials would be tested for their suitability as a thermal backfill material in the trench.

Nearly all of the underground cable systems constructed for high-voltage transmission lines would be installed in conduit using open-cut trenching techniques unless site-specific conditions dictate that open-cut trenching cannot be utilized. The trench for the cable/conduit would normally be a minimum of five feet deep and four feet wide along the entire length of the underground sections.

Duct Bank Installation

As the trench for the underground transmission line is excavated, LADWP would begin to install the cable conduit, reinforcement bar, ground wire, and concrete conduit encasement, which collectively comprise the duct bank.

As described above, the duct bank for the 230 kV underground transmission lines would likely measure approximately 3.5 feet by 3.5 feet. The 230 kV lines would require two cables per phase (bundled). Two trenches would be required for the double-circuit 230 kV line, with one circuit per trench. Additionally, ducts for communication cables, which are required for system protection and communication purposes, would be installed in the same duct bank as the transmission cables.

Where the electrical transmission duct bank would cross or run parallel to other substructures that operate at normal soil temperature (gas lines, telephone lines, water mains, storm drains, sewer lines), a minimal radial clearance of 12 inches (for crossing) and 24 inches (for paralleling) would be required, respectively. Ideal clearances would range from two to five feet. Where duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (other underground transmission circuits, primary distribution cables, steam lines, heated oil lines, etc.), additional radial clearance may be required. Clearances and depths would meet requirements set forth with Rule 33.4 of CPUC GO-128. Preliminary engineering investigations have not identified any underground utilities that operate at high temperatures.

After the duct bank has been installed in the trench, the next step would be to cover the duct bank with backfill and compact the backfill. Each duct bank would require a minimum cover of 36 inches. Finally, a road base or slurry concrete cap would be installed within the trench, and the disturbed surface would be restored in compliance with the locally issued permits. As sections of the trench are covered and restored, additional sections would then be opened for duct bank installation. This process would continue until all PVC conduits have been installed in the duct bank. Note that at this point, the PVC conduit does not contain the transmission line cable; see below (Cable Pulling, Splicing and Termination) for a description of how the underground transmission line would be installed.

Vault Installation

LADWP would excavate and install pre-formed concrete splice vaults or manholes during trenching for the duct banks. Initially, the vaults would be used to pull cable through the conduits and splice the cables together during construction of the BRRTP. During operation, the vaults would provide access to the underground cables for maintenance, inspections, and repairs. Vaults, with approximate dimensions of 25 feet long by seven to ten feet wide, would be constructed of prefabricated steel-reinforced concrete and designed to withstand the maximum credible earthquake in the area and heavy truck traffic loading. Vaults would occur approximately every 800 to 2000 feet along underground segments.

Installation of each vault would take place over a one-week period. First, the vault pit would be excavated and shored, followed by delivery and installation of the vault. Next, the excavated area would be filled with backfill and compacted. Finally, the excavated area would be restored, as required.

Cable Pulling, Spicing and Termination

Following conduit and vault installation, LADWP would pull cable through the duct banks, splice the cable segments at each vault, and terminate cables at the transition stations (where the line would transition from underground to overhead). To pull the cables through the duct banks, a cable reel would be placed at one end of the conduit segment, and a pulling rig would be placed at the opposite end. The cable from the cable reel would be attached to a rope in the duct bank, and the rope linked to the pulling rig, which would pull the rope and the attached cable through the duct banks. A lubricant would be applied as the cable enters the ducts to decrease friction and facilitate travel through the PVC conduits.

The electric and communication cables for the 230 kV circuits would be pulled through the individual ducts at a rate of two to three segments between vaults per day. After cable pulling is completed, the cables would be spliced, or fused together, at each vault. A splice trailer would be stationed at the vault manhole opening with a power generator directly behind the trailer. Crews would enter the vault and splice the cables.

During splicing operations, the dryness of the vault must be continuously maintained to ensure that unfinished splices are not contaminated with water or impurities. It is estimated that splicing would take 50 hours per cable. As splicing is completed at a vault, the splicing apparatus (splicing trailer and power generator) would be moved to the next vault location, where splicing would resume.

Termination structures would be used for the solid dielectric cable to allow the transition from underground to overhead line sections or above-ground equipment.

Transition Structure Construction

At each end of an underground segment, the cables would rise out of the ground at transition structures, which accommodate the transition to overhead lines. Transition structures constructed as part of the proposed Project would consist of a tubular pole structure with an anchor-bolted pier foundation for each circuit set of three or six cables, depending on site parameters. The transition structure would support cable terminations, lightning arresters, and dead-end hardware for overhead conductors.

Special Construction Methods (Trenchless Technologies - Horizontal Boring and Directional Drilling)

In concert with the tasks outlined above, special construction methods (horizontal boring and/or directional drilling) may be required in areas where open trench construction is not feasible. These areas would include railroad and trolley tracks, large utility crossings, roads, drainage crossings, and other environmentally sensitive areas. LADWP would secure the necessary permits to conduct these specialized construction activities, such as a special use permit, encroachment permit, helicopter lift plan, explosives permit, etc.

Horizontal Boring

Horizontal boring (jack-and-bore) simultaneously pushes a steel casing through the crossing and removes the spoil inside the casing with a rotating auger. First, boring pits would be excavated at the sending (entrance) and receiving (exit) ends of the bore. The bore equipment is inserted into the bore pit at the sending end, where a 36- to 42-inch steel casing is pushed through the earth, under the crossing.

Depending on soil conditions, water may be used to lubricate the auger during boring operations. Casings would be welded together incrementally and installed at least three to four feet below the crossing, or as required by local permits. Once the casing is in place, the duct banks would be installed using plastic spacers to secure them in place. The steel casings would remain to protect the conduit once it has been installed; however, use of fiber-reinforced mortar pipes may be preferred in areas where technically feasible. The duct banks and associated cables would consist of the same respective materials and strung by employing a similar method as those installed on the remainder of the underground portions of the BRRTP.

Directional Drilling

Directional drilling uses a jet bit that can be steered to cut through the earth, creating a small pilot hole. A drill rig and control booth would be set up on one side of the directional drill to facilitate drilling operations. A small containment pit would be excavated around the drill stem to contain any drilling fluids used during the drilling process. Once the jet bit has reached the opposite side of the crossing, a reamer along with the casing (if determined for use by final engineering) would be attached to the auger and pulled back through the pilot hole to widen it. Multiple reamers of increasing diameters would be used to incrementally increase the size of the hole to the diameter necessary to install the conduit casings.

Meeting the Purpose and Need

This alternative would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP in meeting its RPS goals, meet electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs. However, effects to ANF and BLM managed lands would not be minimized.

Potential to Avoid and Minimize Environmental Effects

During construction, the environmental impacts of an underground transmission line would be similar to those for major pipeline construction. Potentially greater adverse environmental impacts could be expected because the entire right-of-way would be disturbed instead of disturbance only at tower and support locations along the alignment. Overhead construction has the flexibility to span sensitive features; construction typically would result only in disturbances at individual tower sites and at the ancillary facilities associated with access to the right-of-way. For underground installation in undeveloped areas, the right-of-way would be cleared of all trees, brush, and ground cover in order to establish the transmission line alignment and to permit construction.

Similar to overhead transmission line construction, the installation of underground transmission lines would require permitting, working around traffic and other surface activity that would include storm water control, trenching, laying cable, and avoiding underground utilities. However, the native soils, particularly in the desert, generally possess inferior thermal properties, partly due to inadequate soil moisture levels, which would allow the dissipation of heat away from the cables. The inability to dissipate heat in turn de-rates the cable circuit. It is reasonable to assume that large amounts of more thermally favorable soil or backfill would need to be imported for the Project. Underground construction may require up to five times longer than for overhead transmission lines, creating greater impacts to transportation and traffic.

The required excavation for underground transmission lines would have substantially greater impacts to soils and archaeological, cultural, and biological resources. Turns and bends to the underground transmission line would be very limited and constrained. The permanent placement of an underground line could affect sensitive habitats, such as wetlands and riparian conservation areas, and cultural sites. The potential for the spread of invasive plants, including noxious weeds, would increase. Groundwater flow could also be affected by the presence of an underground trench. Fertile lowland areas and floodplains have the greatest potential for impact to buried archaeological resources. The amount of excavation, use of heavy equipment, increased road use, and presence of large soil piles during construction would create greater impacts to air quality.

The major benefits of underground construction are the absence of overhead transmission towers and reduced long-term impacts to visual resources. The absence of towers would also eliminate risks to avian collision, impacts to fire suppression, and aircraft collisions. Underground transmission lines also require less right-of-way after construction and would therefore reduce long-term land use impacts. However, given the vast amount of existing overhead transmission within the Project area, the need to create new transmission corridors is very low. Routing alternatives for the Project would likely parallel existing transmission lines, therefore reducing the potential visual mitigating benefits of an underground system. Socioeconomic impacts could be greater due to the greater construction costs.

Feasibility

While underground transmission lines are relatively immune to weather conditions, they are vulnerable to cable/splice failure, washouts, seismic events, and incidental excavation. An underground line is relatively easy to operate and maintain although it is more difficult to troubleshoot and repair than an overhead transmission line. Once the problem area is identified, the portion of the line between two splicing vaults would need to be replaced and would require additional excavation and construction. The average downtime or failure for underground high voltage cable systems is 100 to 220 actual hours. Depending upon the nature of the emergency, it could easily require 30 days to conduct repairs of an XLPE cable system, and possibly six months or more if the spare parts are not in inventory or the shelf life of the materials is not current. Long-term outages would be unacceptable for a circuit carrying bulk electric power. Underground transmission lines also have a shorter lifespan than overhead lines due to the degradation of the cable's surrounding insulation.

From a technical point of view, this area makes a poor candidate for an underground transmission line. Underground transmission is not suitable in areas of moderate to steep terrain (such as portions of the Angeles National Forest) and has a greater potential for damage from earthquakes and landslides. A portion of the transmission line would be located in close proximity to the San Andreas Fault zone and a seismic event could damage the underground cable, resulting in transmission loss. Placement of underground transmission lines on a slope for long distances may result in gravity, contraction and expansion effects, moving the cable down-slope. The native soils, particularly in the desert, generally possess inferior thermal properties, partly due to inadequate soil moisture levels, which would allow the dissipation of heat away from the cables. The inability to dissipate heat in turn de-rates the cable circuit. It is reasonable to assume that large amounts of more thermally favorable soil or backfill would need to be imported for the Project.

Access must be sufficient to accommodate the large construction equipment required for the excavation, installation and transport of materials. On steep slopes, access roads would need to be cut in switchback patterns for large construction vehicles.

The basic cost of undergrounding a high-voltage transmission line would be several times more expensive than the cost of overhead construction. The relatively high cost and installation requirements tend to prohibit the application of underground transmission systems for long-distance electric transmission.

Recommendation for Analysis in EIS/EIR

ELIMINATION. An underground high voltage transmission line would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. The principle environmental advantage of undergrounding a transmission line would be the mitigation of adverse visual impacts of the transmission towers and conductors. However, an underground transmission line would still require above-ground ancillary facilities on or adjacent to the right-of-way, and result in substantially greater ground disturbance than overhead transmission lines and longer construction duration. It would create a greater potential for impacts to transportation, traffic, soils, socioeconomics, and archaeological, cultural, biological, and water resources. If an outage occurred, repair times could increase. An underground system would not result in any substantial reduction in other environmental effects, and is also infeasible for long distances. It is therefore not considered a reasonable alternative for the Project, and is recommended for elimination from detailed consideration for the Project components.

5.2.5 Superconductors

Alternative Description

Superconductors are high-capacity, low-impedance cables with either high-temperature superconductor (HTS) or low-temperature superconductor (LTS) wire. The superconductors use the phenomenon of superconductivity—zero electrical resistance is exhibited by many metals at near absolute zero temperature. The high-temperature superconductors operate at high temperatures and utilize liquid nitrogen for cooling. Lower-temperature superconductors operate at lower temperatures and require liquid helium for cooling. Liquid nitrogen is a cheap and abundant refrigerant; however, liquid helium is expensive and difficult to handle. Niobium is a type of material used in superconductors because it has the most favorable critical quantities of superconductivity and is practical to fabricate.

This alternative would use such superconductors in place of the proposed aluminum conductor material. The ability for superconductors to transfer much greater capacity than the proposed aluminum conductor would minimize the number of transmission lines required. Similar to the single-circuit 500 kV transmission line, this alternative would replace the two proposed transmission lines (new 230 kV and existing BR-RIN). The superconductors would be contained in a series of conduits to provide cooling of cables and would require an at-grade or underground installation.

Meeting the Purpose and Need

Superconductors would allow for the same amount of energy to be transmitted as the proposed overhead lines, and would therefore meet the purpose and need for the Project. They would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP in meeting its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs. However, effects to Forest Service and BLM managed lands would not be minimized.

Potential to Avoid and Minimize Environmental Effects

The ability for superconductors to transfer a greater capacity has the potential to minimize the number of towers and right-of-way expansion, therefore minimizing impacts to visual and land use resources. However, superconductors must be contained within a series of conduits that provide cooling to the cable itself (to superconductor's absolute zero, which may be negative 340 degrees Fahrenheit or colder). Therefore, the weight of this setup would require an at-grade or underground installation, thus causing similar impacts as conventional underground transmission.

Feasibility

Superconductors are generally utilized in distribution-level voltages (69 kV and under) or for very short distances (2,000 feet or less). The existing installations of superconductors are in controlled areas such as enclosed stations and test facilities. It would be very difficult to maintain uniform and reliable circulation of coolant in rolling and mountainous terrain for extended distances.

Recommendation for Analysis in EIS/EIR

ELIMINATION. Superconductors have the ability to transfer greater amounts of energy than the proposed aluminum conductors; however, they are still in the developmental stage. The longest high-voltage transmission line utilizing superconductors was only 2,000 feet long, and the technology is currently considered infeasible for long distances. The principle environmental advantage of superconductors would be the mitigation of adverse visual impacts of the transmission towers and conductors. However, superconductors would still require above-ground ancillary facilities on or adjacent to the right-of-way, and result in greater ground disturbance than overhead transmission lines and longer construction duration. It would create a greater potential for impacts to transportation, traffic, soils, socioeconomics, and archaeological, cultural, biological, and water resources. It is therefore not considered a reasonable alternative for the Project, and is recommended for elimination from detailed consideration for the Project components.

5.3 TRANSMISSION ALTERNATIVES

5.3.1 Accessing Other Renewable Resource Areas

Alternative Description

The Renewable Energy Transmission Initiative (RETI) has identified a number of high quality renewable energy areas in Southern California—the Salton Sea/San Diego, Southeastern California, and Tehachapi/Owens Valley. The Salton Sea/San Diego resource area is rich with renewable resources, including substantial amounts of geothermal potential near the Salton Sea, solar resources throughout the area, and wind resources in local mountain ranges. LADWP would need to construct transmission lines to access this renewable resource area. The Southeast California area includes most of San Bernardino and Riverside counties; RETI has identified this resource area as having the largest quantity of potential resources (wind and solar). LADWP's existing transmission lines to this resource area have limited capacity to transfer that energy to the Los Angeles Basin.

LADWP's primary purpose and need for the BRRTP is to access the Tehachapi/Owens Valley resource area. The Mojave Desert has some of the highest solar insolation in the world, along with the most economical solar resources. Furthermore, the Tehachapi Mountains have excellent wind resources. LADWP's existing BR-RIN transmission line currently accesses this renewable resource area; however, transmission capacity is limited.

This alternative would consider accessing the Salton Sea/San Diego and Southeast California resource areas.

Meeting the Purpose and Need

Accessing the Salton Sea/San Diego and Southeast California resource areas would meet LADWP's purpose and need to access renewable resources. However, in order for LADWP to meet its RPS goals and reduce environmental impacts associated with greenhouse gas emissions, it must access a number of renewable resource areas. To effectively integrate wind and solar renewable resources into an electrical system, utility companies generally access a number of renewable resource areas to increase system reliability and flexibility. Concentrating a utility company's resources in one or two renewable resource areas may decrease its system reliability and flexibility. This alternative would also limit LADWP's ability to access renewable resources in the Tehachapi Mountains and Mojave Desert areas. In addition, LADWP also has the ability to integrate the Castaic Power Plant (a pump storage facility in the BRRTP area) to store intermittent renewable energy. LADWP does not have similar facilities in the other renewable resource areas.

Potential to Avoid and Minimize Environmental Effects

The potential environmental impacts associated with accessing these renewable resource areas involve or are likely to involve proposals for new transmission lines with much greater lengths than those proposed by the BRRTP, with associated impacts similar to or even greater than those of the BRRTP. Therefore, these would be likely to result in little to no avoidance of environmental effects when considered as a whole.

Feasibility

Accessing other renewable resource areas is feasible, as evidenced by current transmission line project proposals by LADWP. For example, the Southern Transmission System (STS) upgrade project would access wind and geothermal energy from Utah. Another proposal is the Green Path North Project (GPNP) to access geothermal energy from the Salton Sea, and wind and solar from the Southern California Deserts.

Recommendation for Analysis in EIS/EIR
ELIMINATION. This alternative would access renewable energy and assist in meeting RPS and greenhouse gas reduction goals. However, to integrate intermittent renewable resources and maintain a reliable electrical system, LADWP should access a number of renewable resource areas. This alternative does not meet the purpose and need to deliver renewable energy sources from the Tehachapi Mountains and Mojave Desert areas. LADWP would also not be able to utilize existing facilities that would allow LADWP to store renewable energy. The need to access other renewable resource areas would likely involve the need for new transmission lines and therefore this alternative would be expected to have similar impacts to those of the proposed Project.

5.3.2 Segment D

Alternative Description
Segment D was initially identified in the siting study as a routing opportunity for the siting of a new double-circuit 230 kV transmission line from the Antelope Valley to the Castaic Power Plant. It would generally parallel the Los Angeles Aqueduct from about Cottonwood Creek and head southbound to Lancaster Road, and then west to the Interstate 5 freeway utility corridor within the Angeles National Forest. Five high-voltage transmission lines occur along the Interstate 5 section of the Segment. In addition to the high-voltage transmission lines are oil and gas pipelines. This routing opportunity would require a new 200 foot right-of-way.

After preliminary studies, a number of engineering and environmental issues were identified along Segment D. The Castaic Power Plant only had one available bay for connection of a single circuit. The BRRTP was proposing to add three new circuits into the Castaic Power Plant (a new double-circuit transmission line from the Barren Ridge Switching Station and the addition of a new circuit on existing structures from the power plant to Haskell Canyon). Expansion of the Castaic Power Plant to accommodate additional connection bays would require significant modification of the plant that would be well beyond the scope of the Project and cost hundreds of millions of dollars. Also, the area north of the power plant has very unstable terrain where it would be very difficult to construct a new transmission line. The construction of a new transmission line along Segment D has the potential for impacts to the Old Ridge Route, a historic district in very close proximity to the Castaic Power Plant.

In order for Segment D to connect to the Haskell Canyon Switching Station, it would also require the construction of a new double-circuit transmission line along Segment J. This would be in addition to the proposed addition of a circuit on existing structures along Segment J. Along Segment J would traverse the Castaic Lake State Recreation Area, managed by the County of Los Angeles Department of Parks and Recreation, and also a designated Land and Water Conservation Fund site. Expansion of right-of-way along the Land and Water Conservation Fund site would constitute a conflict with its provisions and would require a conversion of land. The conversion process of Land and Water Conservation Fund land from a recreational use to a non-recreational use may take up to 10 years and require compliance (monetary compensation, land, or both).

During the February 2009 Informational Public Meetings, LADWP, BLM and the Forest Service informed the public of a recommendation to eliminate Segment D due to constraints to the Castaic Power Plant, unstable terrain, constraints of right-of-way expansion on lands south of Castaic, and the potential for significant impacts to the Old Ridge Route. However, the public, as well as elected officials, expressed concern about impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, Agua Dulce, and Antelope Acres. They recommended that the lead agencies reconsider studying Segment D and identify a way to make the route viable.

To make Segment D viable, the alignment was modified to terminate at the proposed Haskell Canyon Switching Station instead of at the Castaic Power Plant as originally proposed. The revised Segment D is approximately 48 miles long and generally parallels the Los Angeles Aqueduct, beginning near Cottonwood Creek and traveling south to Lancaster Road. No existing transmission lines occur along the portion of Segment D located north of the ANF. The segment then proceeds west to the Interstate 5 designated utility corridor, which contains five high-voltage transmission lines and oil and gas pipelines, and heads southeast paralleling LADWP's existing Castaic-Rinaldi Corridor (Castaic-Northridge/Sylmar and Castaic-Olive 230 kV transmission lines) to the proposed Haskell Canyon Switching Station.

Meeting the Purpose and Need
Segment D is an alternative location for the siting of a new 230 kV double-circuit transmission line. Therefore, it would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP in meeting its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs.

The Land and Water Conservation Fund conversion process may take up to 10 years. Although the time delays to obtain Project approval and right-of-way, as well as to build and construct the Project, may hinder LADWP's ability to meet its 2020 RPS goals, there is uncertainty as to the exact timing of the Land and Water Conservation Fund process.

Potential to Avoid and Minimize Environmental Effects
Segment D is located in an area with very few residential viewers and would avoid impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, Agua Dulce, and Antelope Acres. However, it has the potential to have greater visual impacts than the proposed Project. The portion of Segment D north of the Angeles National Forest does not contain existing high-voltage transmission lines and therefore would require the creation of a new utility corridor that would increase visual impacts. More roads would have to be improved or established than for the proposed Project. Also, the Old Ridge Route is listed as a historic district on the National Register. The construction of a new transmission line would alter the visual environment of the Old Ridge Route.

Segment D would avoid the San Francisquito Canyon, which is considered a particularly sensitive resource due to its eligibility for designation as a Wild and Scenic River. However, Segment D has a greater potential to impact land uses than the proposed Project. Sections of land on the Angeles National Forest, adjacent to Segment D, are designated roadless areas. Segment D would potentially contribute to greater degradation of roadless areas as the alignment is closer to them under Segment D than the Proposed Action. Segment D would also traverse the Castaic Lake State Recreation Area, which is also a Land and Water Conservation Fund site; it provides recreational opportunities such as hiking, backpacking, equestrian use, bicycling, mountain biking, and hunting. The addition of a new transmission line would not be in compliance with the provisions of the Land and Water Conservation Fund, and during construction activities the recreational area and trails would be temporarily restricted from public use. Segment D may also disrupt and disturb existing residential land uses associated with the Paradise Ranch Mobile Home Park, the community of Castaic, and development of the North Lake Specific Plan (an approved master-planned community in the Castaic area).

Biological resources also have the potential for greater impacts from Segment D than the proposed Project. Biological surveys conducted along Segment D identified Riparian Conservation Areas (RCAs) that contain suitable habitat for the arroyo toad, California red-legged frog, southwestern willow flycatcher, and least Bell's vireo, which are all federal- or state-listed special-status species. The need to construct or improve more access roads than for the proposed Project would increase the potential for impacts to suitable habitat and the special-status species supported within them. Segment D is more likely than the proposed Project to impact the California Condor due to its closer proximity to known condor use areas.

Finally, Segment D has the potential for greater geological resource impacts. This routing opportunity traverses unstable terrain that is prone to landslides, areas of severe erosion potential, areas with expansive soils and high corrosive potential, areas of groundwater less than approximately 25 feet deep, and areas with potential for inundation from dam failure or seiche. The terrain along this area would make construction of a new transmission line very difficult.

Feasibility
Construction of a new 230 kV double-circuit transmission line along Segment D is feasible. However, as mentioned above, the conversion of Land and Water Conservation Fund lands may be lengthy, and obtaining similar land with comparable value may be very difficult. Segment D's unstable terrain also makes this routing opportunity much more difficult to construct.

Recommendation for Analysis in EIS/EIR
RETENTION. This routing opportunity would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS, greenhouse gas reduction goals, and electrical energy demands. However, in comparison to the proposed Project, it would have a potential for greater environmental impacts to visual resources, land use, biological resources, cultural resources, and geological resources. The required right-of-way through Land and Water Conservation Fund lands and unstable terrain may pose feasibility issues. At the request of the public and elected officials, this routing opportunity was retained to avoid impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, Agua Dulce, and Antelope Acres.

5.3.3 Midway to Vincent Corridor

Alternative Description
The Midway to Vincent Corridor is approximately 15.4 miles long and would traverse the ANF from the designated I-5 Utility Corridor to Segment G. The Midway to Vincent Corridor is also a designated Forest Service utility corridor that contains two existing Southern California Edison (SCE) 500 kV transmission lines (Midway-Vincent #1 and #2). During the siting study, it was identified as a potential routing opportunity for the siting of a new 230 kV transmission line. It was eliminated from further study because the alignment of the corridor traversed west to east across the Angeles National Forest. The purpose of the proposed Project was to transfer energy from the north (Barren Ridge Switching Station) to the south (Haskell Canyon). The greater length of this routing opportunity has the potential to pose reliability issues, and additional footprint across the Angeles National Forest would increase potential impacts to environmental resources.

After the 2009 Informational Public Meetings, the Midway-Vincent Corridor was reconsidered as a routing modification of a viable Segment D. It would avoid the constraints of the Castaic Power Plant, impacts to the Castaic Lake State Recreation Area and Land and Water Conservation Fund lands, and unstable terrain. The Midway to Vincent Corridor is not an end-to-end alternative; it is a routing opportunity through the Angeles National Forest from the Interstate 5 Utility Corridor to Segment G. In order for the Midway to Vincent Corridor to connect to the proposed Haskell Canyon Switching Station, this routing opportunity would require following Segment G south for 9.6 miles to the switching station (total distance of 25 miles).

Meeting the Purpose and Need
The Midway to Vincent Corridor is an alternative location for the siting of a new 230 kV double-circuit transmission line; therefore, it would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need.

Potential to Avoid and Minimize Environmental Effects
The Midway to Vincent Corridor is a designated utility corridor; however, it is relatively undisturbed, has very limited access, and would require the construction of new access and spur roads. The need to construct new access roads would increase the potential for impacts to air quality, biological resources, water resources, and cultural resources when compared to the proposed action, which has existing access. The Midway to Vincent Corridor is also adjacent to designated Back Country Non-Motorized land, and the construction of access roads in these areas would not comply with the Angeles National Forest Land Management Plan.

The Midway to Vincent Corridor has the potential to have the greatest impacts to biological resources in comparison to the other routing opportunities identified for the BRRTP (Segments A through K). The corridor contains the highest concentration of riparian conservation areas, and within the corridor suitable habitat has been identified for several special-status species (including the least Bell's vireo, southwestern willow flycatcher, California red-legged frog, arroyo toad, and unarmored threespine stickleback). The Midway to Vincent Corridor would cross critical habitat for the arroyo toad and traverse a designated Critical Biological (CB) zone of the Angeles National Forest. The southern portion of Segment G that would connect this corridor to the Haskell Canyon Switching Station would not avoid crossing or approaching riparian areas potentially occupied by sensitive resident riparian-dependent wildlife, including the arroyo toad and red-legged frog.

The Midway to Vincent Corridor also has the potential for greater geological resource impacts similar to that of Segment D. It traverses unstable terrain that is prone to landslides, areas of severe erosion potential, areas with expansive soils and high corrosive potential, areas of groundwater less than approximately 25 feet deep, and areas with potential for inundation from dam failure or seiche. The steep and unstable terrain along this corridor would make construction of a new transmission line very difficult.

Although very few residential viewers would be impacted by the Midway to Vincent Corridor, it has the potential for greater visual impacts than the proposed action. The need to construct new access roads for a majority of the corridor would increase impacts to visual resources. Similar to Segment D, it is also in close proximity to the Old Ridge Route (a historic district on the National Register) and has the potential to alter the visual environment. Along the southern portion of Segment G, the San Francisquito Creek is a sensitive resource due to its eligibility for designation as a Wild and Scenic River and would not be avoided by the utilization of the Midway to Vincent Corridor.

Feasibility
Although feasible to construct, the need to build new access roads and a new transmission line in very steep and unstable terrain would pose significant constructability issues similar to those of Segment D.

Recommendation for Analysis in EIS/EIR
ELIMINATION. The Midway to Vincent Corridor would meet the purpose and need for the Project, but is recommended for elimination from further study in the EIS/EIR because it would not significantly reduce or avoid impacts to land use, cultural, biological, and visual resources, or geological hazards. The Midway to Vincent Corridor is much longer than the proposed action, and thus could potentially lead to more geographically extensive impacts. The increased length, steep topography and limited existing

access roads for construction could make the Midway to Vincent Corridor more difficult and costly to build in comparison to the proposed action.

5.3.4 Bouquet Canyon Alternative (Segment H, including the 110th and 115th Street Modifications)

Alternative Description

The Bouquet Canyon Alternative is a routing opportunity for the siting of a new 230 kV transmission line from the Antelope Valley to the proposed Haskell Canyon Switching Station. This routing opportunity would consist of Segment H and the minor 110th and 115th Street modifications; it is not an end-to-end alternative for the proposed Project.

Segment H was identified in the siting study as a routing opportunity from the Antelope Valley to the proposed Haskell Canyon Switching Station. A majority of Segment H would be located on Angeles National Forest System lands and would mostly parallel the newly constructed SCE Antelope-Pardee transmission line. The last 1.5 miles would follow the SCE 66 kV Saugus-Del Sur transmission line that was removed. Unlike with the other identified routing opportunities for the siting of a new transmission line, very limited access occurs along Segment H on the Angeles National Forest. To minimize impacts to the area, helicopter construction would be required to construct the new transmission line. All other routing opportunities for the proposed Project would be constructed via conventional ground construction (described in Section 1.1).

During the 2008 Public Scoping Meetings, residents in the western Lancaster area suggested the 110th Street modification to connect Segment F to Segment H, which would not follow the existing transmission lines to SCE's Antelope Substation. This modification was proposed to avoid bisecting private property near the Antelope Substation.

In February 2009 at the Informational Public Meetings, the same residents requested re-routing the modification to follow SCE's proposed Tehachapi Renewable Transmission Project's alignment along 115th Street instead. This would minimize the creation of numerous new transmission line corridors and lessen impacts to residents. The 115th Street re-route is five miles long and no existing transmission lines are located along this route. It would require slightly more improvements to existing access roads than the original alignment along Segments F and H.

Meeting the Purpose and Need

The Bouquet Canyon Alternative would provide an alternative location for the siting of a new 230 kV double-circuit transmission line and therefore would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP in meeting its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs.

Potential to Avoid and Minimize Environmental Effects

In comparison to the proposed action, the Bouquet Canyon Alternative would avoid impacts to the Wild and Scenic River and minimize the potential for acquisition of private property. Visual impacts would also be minimized, because fewer residential viewers live in close proximity to this alternative. Helicopter construction on the Angeles National Forest would minimize the construction of access roads and result in less ground disturbing activities when compared to the proposed action. The potential for permanent adverse impacts to biological, cultural, visual, and water resources may be minimized.

SCE's Antelope-Pardee 500 kV transmission line has just completed construction, and revegetation and rehabilitation are in progress. Construction of the BRRTP's new transmission line would most likely occur soon after completion of the revegetation and rehabilitation, and many of the same Antelope-Pardee construction staging areas would be utilized. The construction of two transmission line projects in the same area has the potential to increase cumulative effects.

Road and structure construction would remove vegetation, including the root system and topsoil, and would cause further disturbance of an area trying to re-establish. Soil compaction caused by construction would decrease the ability of soil to absorb moisture, and also inhibit seedling establishment. Re-establishment of the construction staging areas following construction of the BRRTP would be very difficult.

Helicopter construction would require utilization of many of the same fly yards and construction staging areas. The large construction staging areas are located mainly on private property and in close proximity to residential areas. Therefore, helicopter construction of the Bouquet Canyon Alternative has the potential to increase land use, noise, and air quality impacts, and most of all cumulative effects to those resources.

SCE is also proposing the construction of another new 500 kV transmission line called the Tehachapi Renewable Transmission Project (TRTP). BRRTP's Segment F and 115th Street modification would parallel TRTP's Segment 4 alignment. A number of high-voltage transmission lines already occur along Segment F. The construction of three transmission lines (Antelope-Pardee, TRTP and BRRTP) in the same vicinity would increase cumulative effects to residences in the area, and transportation and traffic.

Feasibility

Helicopter construction of a second transmission line adjacent to an energized line presents a number of construction and safety hazards. The construction of a new transmission line on very steep terrain down-slope to an adjacent energized line is considerably more dangerous to construct than the proposed BRRTP or the first transmission line in the corridor. Special construction techniques may be required to ensure safe construction of a second transmission line. Where dangers cannot be mitigated, it may be necessary for the adjacent transmission line to be de-energized.

Construction of the BRRTP by helicopter in close proximity to the existing Antelope-Pardee transmission line creates safety concerns: (a) Helicopter construction next to the energized line will necessitate longer than normal lift lines that must be controlled to prevent them from swaying or blowing into the existing energized line; (b) Maintenance, close-up inspection, and security patrols of the proposed line will continually run into the same problems. The inability to perform such actions safely will necessitate outages on one or both lines, which are increasingly difficult to obtain, especially on high-capacity lines such as the two involved. Additionally, waiting for the outage will delay maintenance and/or inspections and could reduce the reliability of the line at times.

Matching of the spans for the existing 500 kV transmission line with that of the proposed 230 kV transmission line may also be difficult. This may create a problem in areas of large crossings. The mitigation for such a situation is to place additional structures at intermediate points between the spans. Also, helicopter construction of such places would involve height offsets far greater than the typical situation. An additional mitigation for such a condition is to use structures that are much larger and stronger in an attempt to duplicate the capabilities of the original line and match it span for span.

In locations where the structures or roads associated with the existing line require some form of slope stabilization, it may not be feasible to construct down-slope. If the problem could not be mitigated with retaining structures or other slope stabilization methods, an alternate location would be required for the impacted structures on the proposed line. Conversely, design and construction of the new line would need to be careful to avoid creating problems for the existing line located upslope.

A majority of Segment H is relatively undeveloped and steep in many places. Very limited access roads exist and some new roads may be required. These roads would be longer than normal in order to negotiate the relatively steep terrain, but would also require more extensive grading and more aggressive slope stabilization work than would be expected along other segments. Flat areas required for tensioning sites and construction areas would also require more extensive grading and slope protection (higher cut/fill volumes) than would be expected on the Proposed Action.

Structures built on the sides of slopes, especially steep slopes, need to be larger than those in the flatter areas found along other routing opportunities. The conductors on the uphill side of the structure must be sufficiently high above the ground to have electrical clearance with the rising nearby slope. This calls for a taller structure than would be required on flatter terrain. Additionally, the legs on the downhill side of the slope need to extend further to intercept the grade as it falls away. Since structures on slopes are most often viewed from the downhill side, which shows the longer legs, the structure appears larger. It is important to understand that since structure heights are often described in terms of the shortest leg, written descriptions of such structures or tabulated spreadsheets of these structures may not adequately describe the visual impact of the actual structure.

Helicopter construction of a new double-circuit 230 kV transmission line adjacent to an energized 500 kV transmission line in steep terrain would pose additional safety concerns in relationship to the proposed action, however this alternative is considered feasible.

Recommendation for Analysis in EIS/EIR

ELIMINATION. The Bouquet Canyon Alternative would meet the purpose and need for the Project. Ground disturbance and visual impacts would be minimized through the use of helicopter construction; however, impacts to air quality and noise would increase. Helicopter construction also poses construction and safety concerns that are not present for the proposed action. Cumulative effects for the Project would also increase because of the further disturbance of revegetated and rehabilitated areas and potential for impacts from three transmission line projects (Antelope-Pardee, TRTP and BRRTP) in the same vicinity.

5.3.5 Green Valley Modification (Alternative 2A)

Alternative Description

During the 2008 scoping meetings, Green Valley residents proposed the modification of Segment G to avoid impacts to their community. The localized modification would be located west of Green Valley, over the ridge, along an existing fire road, and would be approximately one mile from the existing BR-RIN transmission line. The routing modification would be within Angeles National Forest lands, but outside the Forest Service 1000-foot designated utility corridor.

Meeting the Purpose and Need

The Green Valley modification routing alternative would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP in meeting its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs.

Potential to Avoid and Minimize Environmental Effects

While this alternative eliminates or minimizes social and community impacts to Green Valley, it would not minimize overall environmental effects in comparison to the proposed BRRTP. The modification would be located over a mile west of the existing transmission lines and would require a new utility corridor, and would increase the potential for impacts to fire suppression efforts; it would also add an additional crossing of the Pacific Crest Trail (PCT).

The Green Valley Modification would minimize visual impacts to Green Valley residents; however, these visual impacts would occur over a wider area and would not comply with the Forest Land Management Plan (FLMP) direction to conserve the aesthetic, recreation, and open space values of "high-valued scenery such as scenic backdrops for local communities and increasingly rare values such as solitude."

The Green Valley Modification area is relatively undisturbed except for the fire roads that loosely follow the ridge. Suitable habitat for special-status species, such as the arroyo toad, were found during the 2008 field season, and the area also supports unique habitat that is typically of limited areal extent in the region under study (e.g., riparian areas). This routing alternative would increase the significant impacts to biological resources in comparison to the proposed action.

Cultural sites involving multiple burials on private land along the proposed Segment G would be avoided with the Green Valley Modification. However, no cultural surveys have been conducted in the modification area, where there is a potential to uncover cultural sites and historic resources from aqueduct construction.

Feasibility
This routing alternative represents a change to the proposed action alignment and is considered feasible.

Recommendation for Analysis in EIS/EIR
RETENTION. The Green Valley Alternative was recommended for elimination during the Informational Public Meetings because it would create a new utility corridor within the Angeles National Forest and result in greater impacts to National Forest resources in comparison to the proposed action. To address the issues and concerns raised by the community of Green Valley and elected officials, LADWP realigned the proposed new 230 kV transmission line route to skirt the community and accomplish the primary objective of this alternative. However, the Green Valley Alternative as proposed by the community was modified to lessen impacts on the Angeles National Forest, and will also be considered in full detail within the EIS/EIR as a localized alternative to Alternative 2. This routing alternative will be designated Alternative 2a.

5.3.6 Antelope Valley Alternative (Segments C and E)

Alternative Description
The physiography of the Project area can be broken up into two different types: the northern portion of the project area consists of flat desert areas of the Mojave Desert and Antelope Valley, and the southern portion contains the mountains of the Angeles National Forest.

Two routing opportunities from the Mojave Desert area to Antelope Valley were identified for the siting of a new 230 kV transmission line: Segment B and the combination of Segments C and E (referred to as the Antelope Valley Alternative). Segment B is part of LADWP's proposed action and is approximately 27 miles long. It starts just north of Mojave, California, parallel to LADWP's existing 230 kV Barren Ridge – Rinaldi (BR-RIN) and 500 kV Pacific Direct Current Intertie (PDCI) transmission lines, and travels south towards the Antelope Valley California Poppy Reserve. The Antelope Valley Alternative is 33 miles long and would also start just north of Mojave, California, parallel the Los Angeles Aqueduct southwest to Cottonwood Creek, then turn southeast and parallel three existing SCE high-voltage transmission lines to the Antelope Valley California Poppy Reserve. To identify which routing opportunity through the northern portion of the Project would be carried forward in the EIS/EIR, Segment B and the Antelope Valley Alternative were compared.

Meeting the Purpose and Need
The Antelope Valley Alternative would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP to meet its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs.

Potential to Avoid and Minimize Environmental Effects
In comparison to the proposed action, the Antelope Valley Alternative has fewer residences in close proximity to the transmission line (250 feet or less from the proposed centerline) and would avoid impacts to residences. However, the Antelope Valley Alternative would require an additional six miles of transmission line and therefore be expected to have a greater amount of ground disturbance and potential for impacts to environmental resources than Segment B.

The Antelope Valley Alternative would increase visual impacts. Approximately 22 of the 33 miles would be within a new transmission line corridor; the remaining 11 miles of the alternative would parallel three existing SCE transmission lines. Segment B, however, would parallel two existing LADWP transmission lines for its entire length. The Antelope Valley Alternative would also cross the Pacific Crest Trail and come in close proximity to the Antelope Valley California Poppy Reserve.

The potential for impacts to biological and water resources would increase for the Antelope Valley Alternative in comparison to the proposed action. A greater number of stream crossings would occur along the alternative, and it would cross two Significant Ecological Areas (SEAs)—the Joshua Tree Woodlands and San Andreas Rift Zone—ecologically important or fragile land and water areas. It also has the potential to impact valuable plant and animal communities through removal and/or disturbance. The alternative would also generally parallel the Los Angeles Aqueduct; to avoid impacts to the aqueduct, LADWP must construct the new transmission line at least 200 feet from the aqueduct.

Existing access roads occur along the entire length of Segment B, whereas only 13 miles along the Antelope Valley Alternative have existing access. Four miles of the Antelope Valley Alternative would require construction of new access roads and 15 miles would require improvements to existing access roads. The construction and improvements to access roads would increase impacts to air quality and biological, cultural, visual and water resources.

Feasibility
The alternative represents a relatively minor change to the proposed action and is considered feasible.

Recommendation for Analysis in EIS/EIR
The Antelope Valley Alternative would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS and greenhouse gas reduction goals and electrical energy demands. It would avoid impacts to residences in close proximity to the proposed action's Segment B, but would create a new transmission corridor and increase the potential for impacts to visual resources, biological resources, water resources, air quality, and cultural resources. This alternative would also require more new access roads and improvements to the existing access roads.

RETENTION of SEGMENT C. Although Segment C would require the creation of a new utility corridor and the construction and improvement of access roads, and has the potential to increase impacts to air quality, biological resources, cultural resources, visual resources, and water resources, it will be retained for further study to allow Segment D a northern connection to the Barren Ridge Switching Station.

ELIMINATION of SEGMENT E. Segment E would require an additional 6.5 miles in comparison to the proposed action and is recommended for elimination from further study in the EIS/EIR, because it would not significantly reduce or avoid significant impacts to air quality, biological, cultural, visual, and water resources.

5.3.7 Segment I

Alternative Description

Segment I was identified in the siting study as a routing opportunity for the siting of a new double-circuit 230 kV transmission line from the Antelope Valley to the proposed Haskell Canyon Switching Station. It is 31 miles long and traverses 27 miles of privately land and four4 miles of USFS-managed lands, and starts at the Antelope Substation headed southeast to Palmdale (four existing Southern California Edison high-voltage transmission lines occur along this portion), then makes a sharp turn and heads southwest to Haskell Canyon along two existing LADWP high-voltage transmission lines. This routing opportunity would require a new 200- foot ROW.

Just south of SCE'S Antelope Substation are six SCE high- voltage transmission lines. Multi-circuit towers are not an option since SCE owns the transmission lines in theis portion of the segment. Crossing the lines would be very difficult in this area due to the required hierarchy of the various voltages: 230 kV would need to go under 500 kV lines but over 220 kV or 138 kV. Six different lines would need to be crossed, and SCE would need to raise up their its 500 kV line substantially to accommodate the 230 kV line traveling underneath. Also, weaving through the various transmission lines may cause reliability issues for both LADWP and SCE.

Meeting the Purpose and Need

Segment I would convey the same amount of power as the proposed action, and would meet much of the action's basic purpose and need. It would enable the delivery of renewable resources, reduce greenhouse gas emissions, assist LADWP to meet its RPS goals and electrical energy demands, allow for interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas, and maximize the accommodation of future utility needs.

Potential to Avoid and Minimize Environmental Effects

To avoid and minimize acquisition of private property in Leona Valley, the Ritter Ranch re-route was considered, which would parallel SCE's TRTP Segment 2 alignment around the Ritter Ranch Development to LADWP's existing Victorville- – Rinaldi and Adelanto- – Rinaldi 500 kV transmission lines. There is also an area where the line goes south that would creates a triangular "indefensible space"—an area trapped between transmission line corridors that is difficult or impossible for firefighters to access or defend in the event of a fire— and surrounds houses with transmission lines. Undergrounding in Ritter Ranch would be very difficult because of the terrain and need for conversion facilities.

In Agua Dulce, LADWP considered combining the existing 500 kV lines on a double-circuit tower and utilizing the existing ROW to construct the new 230 kV transmission line; additional ROW would be required to accommodate the taller towers and larger conductor swing area. However, LADWP's reliability would be compromised by placing both 500 kV lines on single structures, since these lines deliver a significant portion of the city's power.

To minimize acquisition of private property in Agua Dulce, re-routes were considered that would run along the foothills to skirt the community along the foothills and minor re-route would avoid residences. However, indefensible spaces would be created, and which it would increase the potential for impacts to fire suppression efforts. These re-routes would also have visual impacts to a movie ranch. The re-route that skirts the community would create a new corridor on NFS lands where there are no existing roads or structures, so helicopter construction would be used.

Segment I has a greater number of residences and residential viewers in close proximity to the proposed centerline than the Proposed Action. However, Segment I would avoid impacts to the communities of Elizabeth Lake and Green Valley, and avoid the San Francisquito Canyon (considered a particularly sensitive resource due to its eligibility as a designated Wild and Scenic River),; as well as minimize impacts to the ANF. Therefore, Segment I was retained as a feasible alternative to the proposed Project.

Segment I has a greater potential to impact geological resources than the Proposed Action. It crosses a distinctive geologic feature (white tuff marker beds). Traverses the San Andreas fault zone diagonally and has the longest distance of departure from the high impact areas of all the routing opportunities through the ANF. Segment also has the most miles of high levels of earthquake ground shaking areas and highest ratio percentage of liquefaction zones and corrosive soil areas. (This is partly due to the longer distance of Segment I and the availability of existing geologic data.)

Feasibility
Construction of a new 230 kV double-circuit transmission line along Segment I is feasible.

Recommendation for Analysis in EIS/EIR
RETENTION. This routing opportunity would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS, greenhouse gas reduction goals, and electrical energy demands. However, in comparison to the proposed Project, it would have a potential for greater environmental impacts to visual resources, land use, and potential for geological hazards.

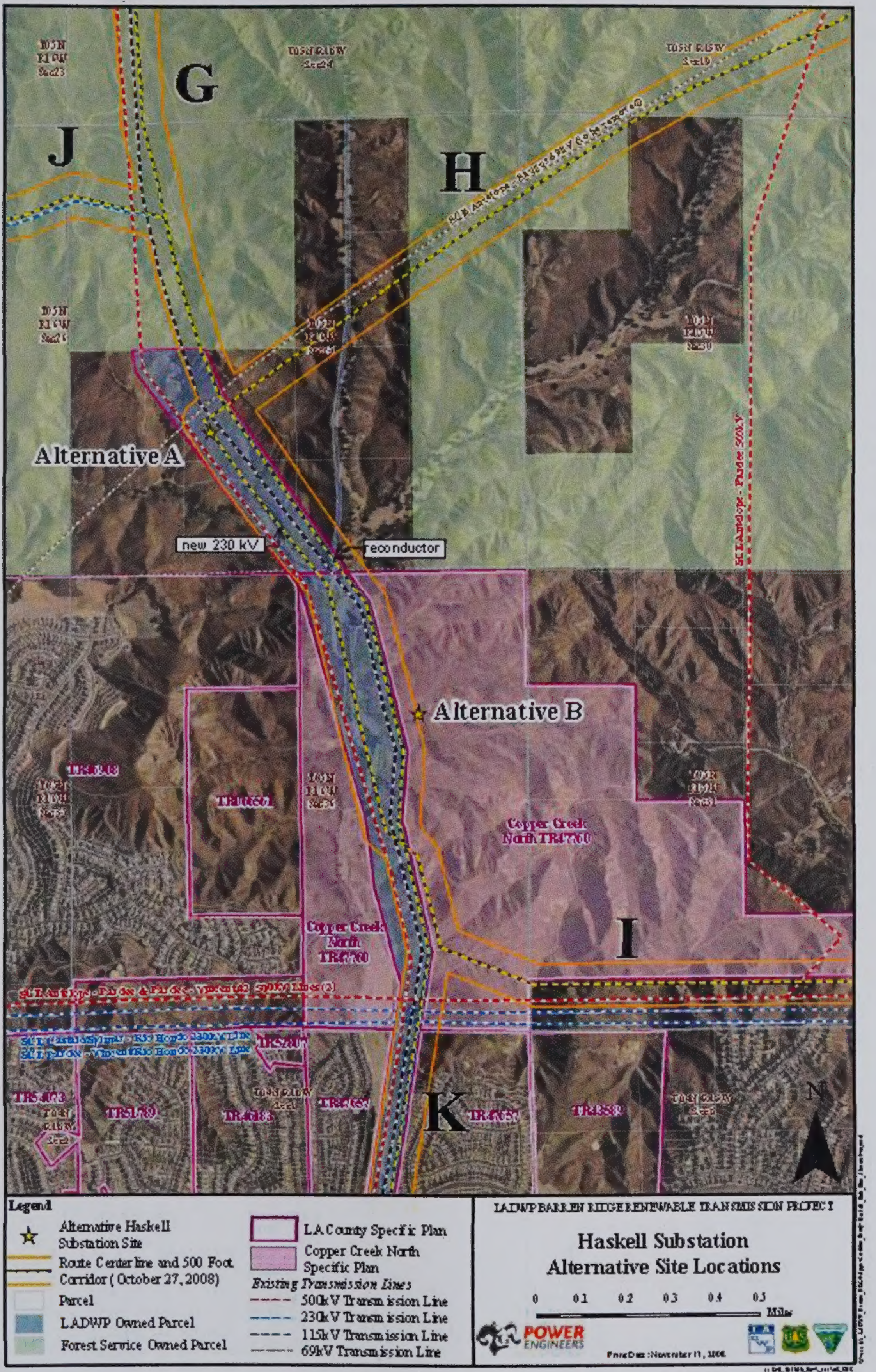
5.3.8 Haskell Canyon Switching Station Site B

Alternative Description
As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the ANF, on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines. The proposed site is referred to as Site A.

The station would be approximately 400 feet by 600 feet to accommodate the necessary equipment, such as circuit breakers, disconnect switches, relays, control cable, relay house, control house, and drainage area. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The internal access road would be approximately 16 feet wide, and the facility would be enclosed by chain-link fencing for security.

Site B was identified as an alternative switching station site, and is located north of Santa Clarita, approximately one mile south of Site A. Figure 7 illustrates the locations of both sites. LADWP would have to acquire additional property to build Site B.

FIGURE 7. HASKELL SUBSTATION ALTERNATIVE SITE LOCATIONS.


G
J
H
Alternative A
new 230 kV
reconductor
Alternative B
Copper Creek North TR47760
Copper Creek North TR47760
I
K
N
Legend
Alternative Haskell Substation Site
Route Centerline and 500 Foot Corridor (October 27, 2008)
Parcel
LADWP Owned Parcel
Forest Service Owned Parcel
LA County Specific Plan
Copper Creek North Specific Plan
Existing Transmission Lines
500kV Transmission Line
230kV Transmission Line
115kV Transmission Line
69kV Transmission Line
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
Haskell Substation Alternative Site Locations
0
0.1
0.2
0.3
0.4
0.5
Miles
POWER ENGINEERS

Potential to Avoid and Minimize Environmental Effects

The proposed Site A would be constructed within Haskell Canyon, approximately 1.5 miles north of residential communities of Saugus and Santa Clarita. Construction of the switching station at Site A would require significant grading and ground disturbing impacts and is anticipated to have a greater potential for impacts to air quality than Site B.

Site B would be located a half mile north of residences in Santa Clarita and would be visible to residents in nearby communities. A planned community development, Cooper Creek North (TR47760), is also planned in the same vicinity. There is also a greater potential for landslides and liquefaction at Site B than Site A.

Feasibility

The construction of a switching station at Site B is feasible; however, there is a potential for significant impacts to the switching station due to landslides and liquefaction. Also, there is a planned development in the same area and acquiring the property may not be feasible.

Recommendation for Analysis in EIS/EIR

ELIMINATION. Site B is in closer proximity to existing and planned residential communities and has the potential for greater impacts to visual resources and land use. There is also a very high potential for landslide and liquefaction within this area, and it would therefore not be feasible to construct the switching station at this site. Therefore, Site B is recommended for elimination from further study in the EIS/EIR.

5.4 SUMMARY TABLE OF ALTERNATIVES CONSIDERED AND ELIMINATED

The summary table below lists all alternatives that were considered for the proposed Project and identifies: 1) the alternative's ability to meet the purpose and need of the Project; 2) the alternative's potential to avoid or minimize environmental effects; 3) if the alternative is feasible; 4) recommendation for analysis in the EIS/EIR; and 5) rationale for retention or elimination.

TABLE 4. SUMMARY OF ALTERNATIVES CONSIDERED AND ELIMINATED

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
SYSTEM ALTERNATIVES					
Energy Conservation & Demand-Side Management	No	Yes	Yes	Elimination	This alternative alone will not meet the electrical energy demands, meet RPS goals, or achieve greenhouse gas emission reduction. It would avoid and minimize environmental effects from the construction of a new transmission line.
Distributed Generation & In-basin Generation Expansion	No	Yes	Yes	Elimination	This alternative alone will not meet the electrical energy demands, meet RPS goals, achieve greenhouse gas emission reduction, or increase overall system reliability, nor would it provide delivery of renewable energy at a level and within a timeframe necessary to meet purpose and need.
Solar Alternative	No	Yes	Yes	Elimination	LADWP's current Solar Energy Plan would provide approximately 10% of LADWP's electrical demand. Although this alternative may avoid or minimize environmental effects from the proposed Project, this alternative alone would not meet the electrical energy demands or RPS goals. Additional transmission capacity may also be required to transfer solar energy from the Mojave Desert area to the Los Angeles Basin.
Reconductor Existing Transmission Line (No New Transmission Line)	No	Yes	Yes	Elimination	Transfer capacity of the utility corridor from Barren Ridge to the proposed Haskell Canyon Switching Station would be constrained, thereby limiting delivery of renewable energy, ability to meet future electrical demands, RPS goals, and greenhouse gas reductions goals, and interconnection and expansion of renewable energy in the Tehachapi Mountains and Mojave Desert areas. Construction of a temporary shoe-fly and need for additional transmission capacity would not minimize or avoid impacts to environmental resources.
New 230 kV Transmission Line (No Reconductoring)	No	Yes	Yes	Elimination	This alternative would allow LADWP to access renewable resources in the Tehachapi Mountains and Mojave Desert areas. By removing the reconductoring portion of the proposed Project, it would minimize the potential for impacts to environmental resources and reduce cumulative impacts of the proposed Project. LADWP's ability to meet projected electrical energy demands would be limited.

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
DESIGN ALTERNATIVES					
Direct Current Transmission	Yes	No	No	Elimination	The direct current system would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. The number of transmission line towers would be minimized and right-of-way expansion reduced. However, large converter stations may increase the potential for impacts to air quality, land use, biological resources, earth resources, water resources, and visual resources. A multi-terminal DC system is technically and economically not feasible and therefore may limit the future interconnections into the system. That converter stations also come at considerably higher costs without clear benefits as compared to AC make this alternative infeasible for LADWP.
Quad-Circuit Towers	No	Yes	Yes	Elimination	Although this alternative would require less permanent right-of-way and minimize permanent impacts to visual resources, land use, and impacts to ANF- and BLM-managed lands, it would have limited transmission capacity to deliver renewable energy, and would therefore limit LADWP's ability to reduce greenhouse gas emissions, meet RPS goals and electrical demands, and allow interconnection and expansion of renewable energy resources. It would also create greater temporary impacts to construct the shoe-fly and remove the existing BR-RIN.
Alternative Voltages	Yes	No	No	Elimination	The single-circuit 500 kV transmission line would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. However, it may not be feasible to construct a 500/230 kV substation within Haskell Canyon. The need for 500 kV to 230 kV conversions may limit LADWP on the number of interconnections to renewable energy projects. The increased footprint of the substations also has the potential to increase environmental impacts.

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
Underground Transmission	Yes	No	No	Elimination	An underground high-voltage transmission line would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. The principle environmental advantage of undergrounding a transmission line would be the mitigation of adverse visual impacts of the transmission towers and conductors. However, it would still require above-ground ancillary facilities on or adjacent to the right-of-way, and result in greater ground disturbance than overhead transmission lines and longer construction duration. It would create a greater potential for impacts to transportation, traffic, soils, socioeconomics, and archaeological, cultural, biological, and water resources. If an outage occurred, repair times could increase. An underground system would not result in any substantial reduction in environmental effects, and is also infeasible for long distances.
Superconductors	Yes	No	No	Elimination	Superconductors have the ability to transfer greater amounts of energy than the proposed aluminum conductors. However, they are still in the developmental stage and considered infeasible for long distances. The principle environmental advantage of superconductors would be the mitigation of adverse visual impacts of the transmission towers and conductors. However, superconductors would still require above-ground ancillary facilities on or adjacent to the right-of-way, and result in greater ground disturbance than overhead transmission lines and longer construction duration. It would create a greater potential for impacts to transportation, traffic, soils, socioeconomics, and archaeological, cultural, biological, and water resources.
TRANSMISSION ALTERNATIVES					
Accessing Other Renewable Resource Areas	No	No	Yes	Elimination	This alternative would access renewable energy and assist in meeting RPS and greenhouse gas reduction goals. This alternative does not meet the purpose and need to deliver renewable energy sources from the Tehachapi Mountains and Mojave Desert areas. LADWP would also not be able to utilize existing facilities that would allow LADWP to store renewable energy. The need to access other renewable resource areas would likely involve the need for new transmission lines and therefore this alternative would be expected to have similar impacts to those of the proposed Project.

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
Segment D	Yes	Yes	Yes	Retention	This routing opportunity would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. However, in comparison to the proposed Project, it would have a potential for greater environmental impacts to visual resources, land use, biological resources, cultural resources, and geological resources. The required right-of-way through Land and Water Conservation Fund lands and unstable terrain may pose feasibility issues. At the request of the public and elected officials, this routing opportunity was retained to avoid impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, Agua Dulce, and Antelope Acres.
Midway Vincent Corridor	Yes	No	Yes	Elimination	The Midway to Vincent Corridor would meet the purpose and need for the Project, but is recommended for elimination from further study in the EIS/EIR because it would not significantly reduce or avoid impacts to land use, cultural, biological, and visual resources, or geological hazards. The Midway to Vincent Corridor is much longer than the proposed action, and thus could potentially lead to more geographically extensive impacts. The increased length, steep topography and limited existing access roads for construction could make the Midway-Vincent sub-route more difficult and costly to build in comparison to the proposed action.
Bouquet Canyon Alternative (Segments H, including 110th & 115th Modifications)	Yes	No	Yes	Elimination	The Bouquet Canyon Alternative would meet the purpose and need for the Project. Ground disturbance and visual impacts would be minimized through the use of helicopter construction; however, impacts to air quality and noise would increase. Helicopter construction also poses construction and safety concerns that are not present for the proposed action or other routing opportunities. Cumulative effects for the Project would also increase because of the further disturbance of revegetated and rehabilitated areas and potential for impacts from three transmission line projects in the same vicinity.

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
Green Valley Modification (Alternative 2A)	Yes	Yes	Yes	Retention	The Green Valley Modification would create a new transmission line corridor through the Angeles National Forest and add an additional crossing of the Pacific Crest Trail. This would increase the potential for impacts to visual resources, land use and recreation, fire suppression efforts, and biological resources. In response to the concerns of the community of Green Valley, LADWP has realigned the proposed new 230 kV transmission line route to skirt the community and accomplish the primary objective of this alternative; however, the routing alternative proposed by the community of Green Valley will also be carried forward for full analysis in the EIS/EIR.
Antelope Valley Alternative (Segment C and E)	Yes	No	Yes	Segment C: Retention Segment E: Elimination	The Antelope Valley Alternative would transfer renewable energy, and assist LADWP in meeting RPS goals, greenhouse gas reduction goals, and electrical energy demands. It would avoid impacts to residences in close proximity to the proposed action's Segment B, but would create a new transmission corridor and increase the potential for impacts to visual resources, biological resources, water resources, air quality, and cultural resources. This alternative would also require more new access roads and improvements to the existing access roads. *RETENTION of SEGMENT C.* Although Segment C would require the creation of a new utility corridor and the construction and improvement of access roads, and has the potential to increase impacts to air quality, biological resources, cultural resources, visual resources, and water resources, it will be retained for further study to allow Segment D a northern connection to the Barren Ridge Switching Station. *ELIMINATION of SEGMENT E.* Segment E would require an additional 6.5 miles in comparison to the proposed project and is recommended for elimination from further study in the EIS/EIR, because it would not significantly reduce or avoid impacts to air quality, biological, cultural, visual, and water resources.

ALTERNATIVES	MEETS PURPOSE & NEED	POTENTIAL TO AVOID OR MINIMIZE ENVIRONMENTAL EFFECTS	FEASIBILITY	RECOMMENDATION FOR ANALYSIS IN EIS/EIR	RATIONALE
Segment I	Yes	Yes	Yes	Retention	RETENTION. This routing opportunity would meet the purpose and need of the Project to transfer renewable energy, and assist LADWP in meeting RPS, greenhouse gas reduction goals, and electrical energy demands. However, in comparison to the proposed Project, it would have a potential for greater environmental impacts to visual resources, land use, and potential for geological hazards.
Haskell Canyon Switching Station	Yes	No	No	Elimination	Site B has the potential for greater impacts to visual resources and land use, because it is in closer proximity to existing and planned residential communities than Site A. Site B also has a greater potential for landslide and liquefaction and it may not be feasible to construct the switching station at this site.

6 ALTERNATIVES TO BE ANALYZED IN THE EIS/EIR

An EIS/EIR will be prepared as an informational disclosure document used to inform agency decision makers and the public of the environmental effects of the Project, identify possible ways to eliminate or minimize the potential significant or adverse effects, and describe reasonable alternatives to the proposed action/Project.

LADWP, the Forest Service and the BLM have identified that the proposed Project would have a potential to impact biological resources, cultural resources, earth resources, water resources, land use, public health and safety, recreation, and visual resources.

The following alternatives, as well as the no action alternative, were identified as a reasonable range of alternatives to the Project that would feasibly attain most of the basic objectives of the Project, but avoid or substantially lessen any of the significant or adverse effects of the Project.

6.1 NO ACTION ALTERNATIVE

NEPA Regulations (40 C.F.R. 1502.14(d)) and CEQA Guidelines (Section 15126.6(e)) require the analysis of the No Action Alternative. Under the No Action Alternative, the construction of a new 230 kV transmission line, the construction of a new Haskell Canyon Switching Station, or the expansion of the existing Barren Ridge Switching Station would not occur. The EIS/EIR must address the resulting environmental effects from taking no action and compare it to the effects of permitting the proposed action or an alternative to the proposed action.

6.2 ROUTING ALTERNATIVES TO BE EVALUATED IN THE EIS/EIR

The regional siting study identified nine routing opportunities (Segments A through I) for the new 230 kV transmission line. As discussed within earlier sections of this report, some of the routing opportunities were adjusted or modified based on public input and preliminary environmental review, and preliminary electrical system studies. Segments E and H were recommended for elimination in Section 5.3. The remaining seven routing opportunities (Segments A, B, C, D, F, G and I) were combined to create end-to-end routing alternatives for the proposed double-circuit 230 kV transmission line between Barren Ridge Switching Station and the proposed Haskell Canyon Switching Station (see Figure 9). Descriptions of these routing alternatives follow in the sections below.

In addition to a new double-circuit 230 kV transmission line from Barren Ridge to Haskell Canyon, Alternatives 1 though 3 would also include the addition of a new circuit on existing towers between the Castaic Power Plant and Haskell Canyon, reconductoring of the existing BR-RIN transmission line, construction of a new Haskell Canyon Switching Station, and expansion of the existing Barren Ridge Switching Station.

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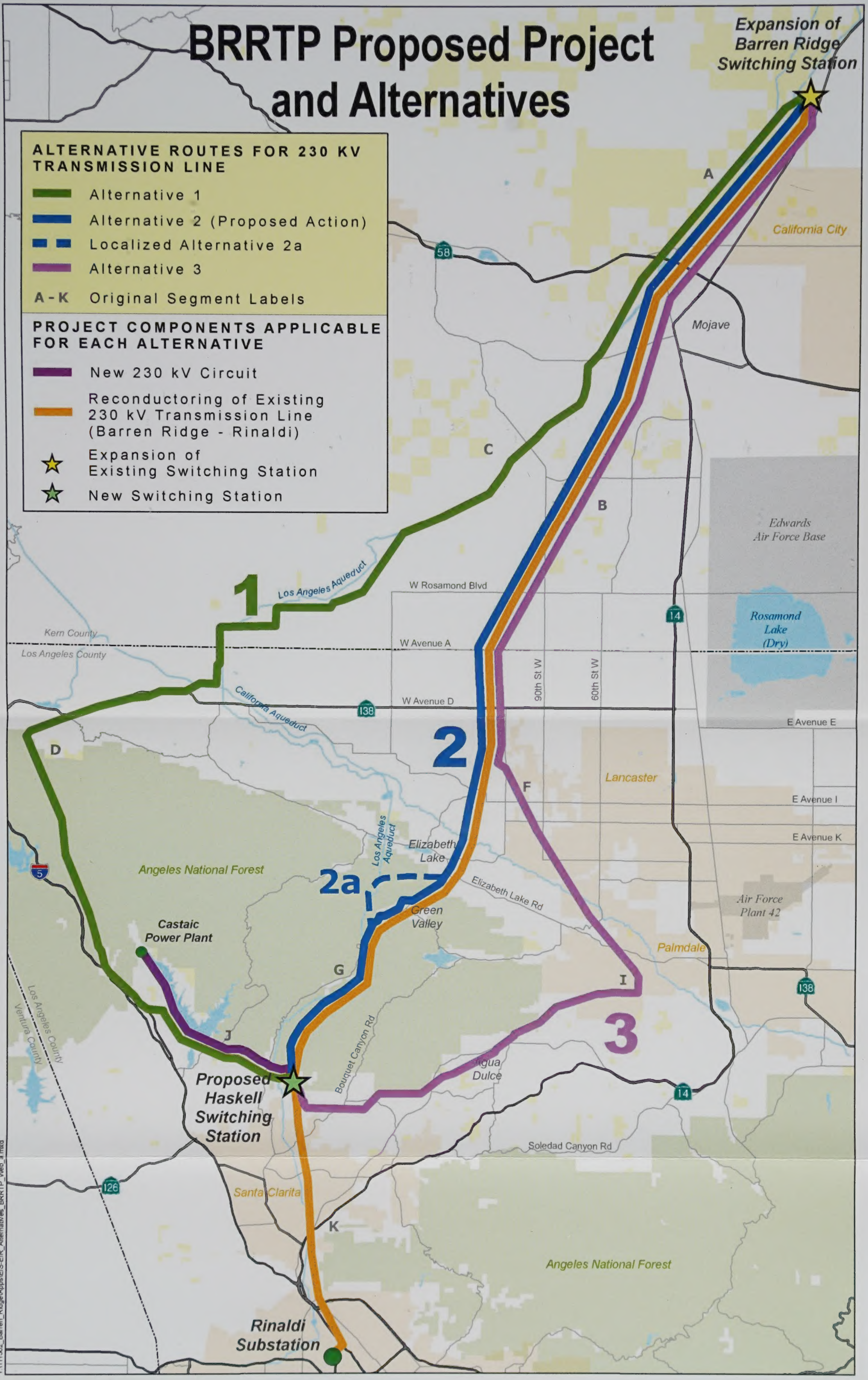
FIGURE 8. ALTERNATIVES TO BE EVALUATED IN THE EIS/EIR


BRRTP Proposed Project and Alternatives
ALTERNATIVE ROUTES FOR 230 KV TRANSMISSION LINE
Alternative 1
Alternative 2 (Proposed Action)
Localized Alternative 2a
Alternative 3
A - K Original Segment Labels
PROJECT COMPONENTS APPLICABLE FOR EACH ALTERNATIVE
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
A
B
C
D
F
G
I
J
K
1
2
2a
3
California City
Mojave
58
14
138
126
5
Edwards Air Force Base
Rosamond Lake (Dry)
W Rosamond Blvd
W Avenue A
W Avenue D
E Avenue E
E Avenue I
E Avenue K
90th St W
60th St W
Los Angeles Aqueduct
California Aqueduct
Kern County
Los Angeles County
Ventura County
Lancaster
Palmdale
Air Force Plant 42
Elizabeth Lake
Elizabeth Lake Rd
Green Valley
Angeles National Forest
Castaic Power Plant
Proposed Haskell Switching Station
Bouquet Canyon Rd
Agua Dulce
Soledad Canyon Rd
Santa Clarita
Rinaldi Substation
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6.2.1 Alternative 1 (Segments A, C, and D)

Alternative 1 is comprised of Segments A, C, and D. It runs from the Barren Ridge Switching Station to Mojave while paralleling LADWP's existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It continues south-southeast to parallel the Los Angeles Aqueduct to Lancaster Road, where it travels west to the Interstate 5 utility corridor. It then runs southeast along LADWP's existing Castaic – Rinaldi corridor to the proposed Haskell Canyon Switching Station. This alternative would avoids impacts to the communities of Elizabeth Lake, Green Valley, Leona Valley, Agua Dulce, and Antelope Acres.

6.2.2 Alternative 2 (Segments A, B, and G) – LADWP's Proposed Action

Alternative 2, LADWP's Proposed Action, is comprised of Segments A, B, and G. It begins at the Barren Ridge Switching Station and runs south, paralleling LADWP's existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It travels south from Mojave towards the Antelope Valley California Poppy Reserve. It continues south into National Forest System lands, remaining within designated utility corridors, and ends at the proposed Haskell Canyon Switching Station.

6.2.3 Alternative 2a (Segments A, B, and G, with Localized Green Valley Alternative)

Alternative 2a is comprised of Segments A, B, and G, and includes the localized Green Valley alternative. It begins at the Barren Ridge Switching Station and runs south, paralleling LADWP's existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It travels south from Mojave towards the Antelope Valley California Poppy Reserve. It continues south into National Forest System lands, bypasses the community of Green Valley, and over the ridge along an existing fire road. The routing modification would be within Angeles National Forest lands, but outside the Forest Service 1000-foot designated utility corridor. The Alternative connects back to Segment G south of Green Valley, and ends at the proposed Haskell Canyon Switching Station.

6.2.4 Alternative 3 (Segments A, B, F, and I)

Alternative 3 is comprised of Segments A, B, F, and I. It begins at the Barren Ridge Switching Station and runs south, paralleling LADWP's existing 230 kV BR-RIN and 500 kV PDCI lines. It travels south from Mojave towards the Antelope Valley California Poppy Reserve. It then travels southeast past SCE's Antelope Substation to Palmdale, paralleling SCE's existing high-voltage transmission lines. It makes a sharp turn to the south-southwest to Haskell Canyon while paralleling LADWP's existing Victorville-Rinaldi 500 kV and Adelanto-Rinaldi 230 kV transmission lines. This alternative would avoid potential impacts to the eligible Wild and Scenic River and minimize impacts to Angeles National Forest lands.

APPENDIX D: REGULATORY FRAMEWORK

Appendix D to the Draft EIS/EIR discusses applicable regulations, plans, and standards associated with the Proposed Action and Alternatives. This printed Final EIS/EIR Appendix D contains only those additions and modifications made to Appendix D to the Draft EIS/EIR in the development of the Final EIS/EIR. The full appendix is available at http://www.ladwp.com/barrenridge.

D.1 COMMON TO ALL RESOURCES

The following additional information is added to Section D.1:

Desert Renewable Energy Conservation Plan

The Desert Renewable Energy Conservation Plan (DRECP), signed into law on April 12, 2011, increases California's renewable energy portfolio standard to 33 percent of all retail electricity sales by 2020. Executive Order #S-14-08 mandated the development of the DRECP, which is a major component of California's renewable energy planning effort. The DRECP would provide binding, long-term endangered species permit assurances, affording effective protection and conservation of desert ecosystems, while facilitating the review and approval of renewable energy projects in the Mojave and Colorado deserts. A Renewable Energy Action Team, consisting of the California Energy Commission, California Department of Fish and Game (CDFG), Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service, was formed to oversee the implementation of the DRECP.

Solar Energy Development Programmatic EIS

The Solar Energy Development Programmatic EIS is being prepared by the U.S. Department of Energy, Energy Efficiency and Renewable Energy Program and the BLM to assess environmental impacts associated with the development and implementation of agency-specific programs that would facilitate environmentally responsible utility-scale solar energy development in six western states (Arizona, California, Colorado, New Mexico, Nevada, and Utah). Environmental policies and design features (i.e., mitigation requirements) would be established. The study area encompasses 24 proposed solar energy zones where the BLM would prioritize energy development.

D.10 TRAFFIC

The following table is amended in Section D.10:

TABLE D-14. TRAFFIC AND TRANSPORTATION LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Applicable Law	Description
Federal	
CFR Title 14 Aeronautics and Space, Part 77: Objects Affecting Navigable Airspace (14 CFR 77)	This regulation establishes standards for determining physical obstructions to navigable airspace; sets noticing and hearing requirements; and provides for aeronautical studies to determine the effect of physical obstructions to the safe and efficient use of airspace.

Applicable Law	Description
CFR Title 49, Subtitle B	49 CFR Subtitle B includes procedures and regulations pertaining to interstate and intrastate transport (including hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles that operate on public highways.
State	
CVC Division 2, Chapter 2.5; Division 6, Chapter 7; Division 13, Chapter 5; Division 14.1, Chapter 1 & 2; Division 14.8; Division 15	This code includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code, Division 1, Chapter 3; Division 2, Chapter 5.5	This code includes regulations for the care and protection of State and county highways and provisions for the issuance of written permits.
Local	
Kern County Encroachment Permits	Encroachment permits must be obtained to proceed with construction within the County and County road right-of-way in addition to the cities located within the construction work zone.
Kern County General Plan Circulation Element	Level of Service "D" has been established as the minimum system-wide traffic standard outside of the Rosamond Traffic Impact Fee area (minimum Level of Service "C").
Kern County Road Department	Transportation permits must be obtained from the Permits Engineer for any oversized or overweight (heavy) loads that will utilize County maintained roads, which may require California Highway Patrol escort.
Los Angeles County Encroachment Permits	Encroachment permits must be obtained to proceed with construction within the County in addition to the cities located within the construction work zone.
Los Angeles County CMP	A significant impact will occur if project traffic degrades the LOS of a facility to LOS "E" or worse, unless a facility already operates at LOS "E" or worse, as defined by the Congestion Management Program.
City of Los Angeles Department of Transportation	Quantitative impacts can occur within LOS C, D, E, or F, but LOS E and F are considered unacceptable conditions.
City of Santa Clarita Traffic and Transportation	Quantitative impacts can occur within LOS D, E, or F but LOS E and F are considered unacceptable conditions for major roadways.

D.16 BIOLOGICAL RESOURCES

The following additional information is added to Section D.16.2:

California Fish and Game Code Section 3503 and 3503.5

These Codes prohibit the take, possession, or needless destruction of the nests or eggs of any bird, including birds of prey or their nests or eggs, except as otherwise provided by the code or any regulation made pursuant thereto. The administering agency for the above authority is the CDFG.

APPENDIX F: DATA TABLES

Appendix F contains various data tables to support the Draft and Final EIS/EIR. Contained in this printed Appendix F to the Final EIS/EIR are only those additions made to Appendix F in the development of the Final EIS/EIR. A full version of Appendix F to the Final EIS/EIR is available at http://www.ladwp.com/barrenridge.

TABLE EJ-1. SUMMARY OF POTENTIALLY AFFECTED CENSUS BLOCK GROUPS

EJ-1.A. LOW-INCOME POPULATIONS: ALTERNATIVE 1 (OVER 22 PERCENT OF TOTAL UNDER POVERTY THRESHOLD)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
A, B, C	Block Group 1, Tract 59, Kern	850	$8,756	850	416	48.94%	517	60.82%
A, B, C	Block Group 3, Tract 59, Kern	1,518	$13,242	1,482	532	35.90%	743	50.13%
A, B, C	Block Group 3, Tract 60.04, Kern	97	$7,660	97	32	32.99%	70	72.16%
D	Block Group 3, Tract 9200.36, LA	542	$17,576	534	165	30.90%	199	37.30%
A, B, C	Block Group 2, Tract 59, Kern	898	$12,448	898	253	28.17%	429	47.77%
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.33%	343	42.03%
D	Block Group 1, Tract 2, Ventura	1,249	$12,498	1,249	305	24.40%	569	45.60%
D	Block Group 2, Tract 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, D, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.65%	509	31.27%
	Total	**154,737**	**n/a**	**146,609**	**10,536**	**7.20%**	**18,198**	**12.40%**
	Kern County	661,645		630,771	130,949	20.8%	173,090	27.4%
	Los Angeles County	9,519,338		9,349,771	1,674,599	17.9%	2,232,000	23.9%
	Kern and Los Angeles counties combined	10,180,983		9,980,542	1,805,548	18.1%	2,405,090	24.1%
	California	33,871,648		33,100,044	4,706,130	14.2%	6,354,171	19.2%

EJ-1.B. LOW-INCOME POPULATIONS: ALTERNATIVE 2 (OVER 22 PERCENT OF TOTAL UNDER POVERTY THRESHOLD)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
A, B, C	Block Group 3, Tract 60.04, Kern	97	$7,660	97	32	33.00%	70	72.20%
G, H, I, K	Block Group 3, Tract 9200.36, LA	542	$17,576	534	165	30.90%	199	37.30%
B, Brunet, F, H, I	Block Group 2, Tract 9009, LA	540	$13,727	532	163	30.60%	270	50.80%
A, B, C	Block Group 2, Tract 59, Kern	898	$12,448	898	253	28.20%	429	47.80%
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.30%	343	42.00%
G, H, I, K	Block Group 2, Track 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.70%	509	31.30%
	Total	**173,656**	**n/a**	**164,608**	**11,392**	**6.90%**	**20,144**	**12.20%**
	Kern County	661,645		630,771	130,949	20.8%	173,090	27.4%
	Los Angeles County	9,519,338		9,349,771	1,674,599	17.9%	2,232,000	23.9%

EJ-1.C. Low-Income Populations: Alternative 3 (over 22 percent of total under poverty threshold)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.30%	343	42.00%
I	Block Group 1, Tract 9105.03, LA	2,160	$12,254	2,160	588	27.20%	728	33.70%
I	Block Group 6, Tract 9010.06, LA	1,535	$10,009	1,521	407	26.80%	569	37.40%
I	Block Group 1, Tract 9104.04, LA	1,190	$13,458	1,114	273	24.50%	400	35.90%
I	Block Group 1, Tract 9102.05, LA	1,148	$31,624	1,148	277	24.10%	347	30.20%
G, H, I, K	Block Group 2, Tract 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.70%	509	31.30%
I	Block Group 1, Tract 9104.02, LA	1,892	$10,399	1,892	445	23.50%	707	37.40%
	Total	**339,452**	**n/a**	**323,499**	**32,465**	**10.00%**	**52,903**	**16.40%**
	Kern County	661,645		630,771	130,949	20.8%	173,090	27.4%
	Los Angeles County	9,519,338		9,349,771	1,674,599	17.9%	2,232,000	23.9%
	Kern and Los Angeles counties combined	10,180,983		9,980,542	1,805,548	18.1%	2,405,090	24.1%
	California	33,871,648		33,100,044	4,706,130	14.2%	6,354,171	19.2%

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EJ-1.D. MINORITY POPULATIONS ALTERNATIVE 1 (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
D	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.40%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	0.00%	0	0.00%	15	15.50%	42	43.30%	0	0.00%	0	0.00%	5	5.20%	0	0.00%
D	Block Group 1, Tract 2, Ventura	1,249	484	0.6%	8	0.6%	76	6.1%	5	0.4%	0	0.0%	593	47.5%	83	6.6%	1,038	83.1%
	Total				**5,845**	**3.8%**	**983**	**0.6%**	**8,401**	**5.5%**	**328**	**0.2%**	**12,237**	**8.0%**	**6,425**	**42%**	**31,415**	**20.4%**
	Kern County				38,804	5.99%	9,014	1.4%	21,562	3.3%	778	0.1%	155,595	23.5%	29,500	4.5%	254,059	38.4%
	Los Angeles County				916,907	9.6%	68,471	0.7%	1,134,263	11.9%	27,221	0.3%	2,262,925	23.8%	486,792	5.1%	4,243,487	44.6%
	Kern and Los Angeles counties combined				955,711	9.4%	77,485	0.8%	1,155,825	11.4%	27,999	0.3%	2,418,520	23.8%	516,292	5.1%	4,497,546	44.2%
	California	33,871,648	20,122,959	59.4%	2,219,190	6.6%	312,215	0.9%	3,682,975	10.9%	113,858	0.3%	5,725,844	16.9%	1,694,607	5.0%	10,969,132	32.4%

EJ-1.E. MINORITY POPULATIONS ALTERNATIVE 2 (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
G, H, I, K	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.40%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	36.10%	0	0.00%	15	15.50%	42	43.30%	0	0.00%	0	0.00%	5	5.20%	0	0.00%
	Total	**171,828**	**134,699**	**78.40%**	**7,575**	**4.40%**	**1,130**	**0.70%**	**8,932**	**5.20%**	**334**	**0.20%**	**11,985**	**7.00%**	**7,173**	**4.20%**	**31,101**	**18.70%**

EJ-1.F. MINORITY POPULATIONS ALTERNATIVE 3 (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
G, H, I, K	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.42%
I	Block Group 1, Tract 9104.02, LA	1,892	468	24.74%	485	25.63%	37	1.96%	8	0.42%	0	0.00%	742	39.22%	152	8.03%	1,103	58.30%
I	Block Group 3, Tract 9105.01, LA	1,932	503	26.04%	565	29.24%	64	3.31%	0	0.00%	0	0.00%	682	35.30%	118	6.11%	1,125	58.23%
Brunet, F, H, I	Block Group 1, Tract 9010.03, LA	5,008	1,618	32.31%	1,656	33.07%	222	4.43%	277	5.53%	16	0.32%	998	19.93%	221	4.41%	1,498	29.91%
I	Block Group 2, Tract 9105.01, LA	1,960	642	32.76%	563	28.72%	0	0.00%	0	0.00%	0	0.00%	598	30.51%	157	8.01%	1,022	52.14%
I	Block Group 2, Tract 9104.02, LA	1,881	635	33.76%	357	18.98%	0	0.00%	0	0.00%	0	0.00%	842	44.76%	47	2.50%	1,215	64.59%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	36.08%	0	0.00%	15	15.46%	42	43.30%	0	0.00%	0	0.00%	5	5.15%	0	0.00%
I	Block Group 1, Tract 9101, LA	1,450	608	41.93%	7	0.48%	37	2.55%	37	2.55%	0	0.00%	704	48.55%	57	3.93%	1,113	76.76%
I	Block Group 1, Tract 9105.01, LA	1,595	698	43.76%	292	18.31%	0	0.00%	7	0.44%	0	0.00%	581	36.43%	17	1.07%	891	55.86%
I	Block Group 1, Tract 9104.03, LA	2,310	1,028	44.50%	392	16.97%	62	2.68%	0	0.00%	19	0.82%	782	33.90%	26	1.13%	1,656	71.69%
I	Block Group 1, Tract 9010.05, LA	1,642	764	46.53%	403	24.54%	0	0.00%	90	5.48%	0	0.00%	334	20.34%	51	3.11%	487	29.66%
I	Block Group 1, Tract 9105.02, LA	1,762	848	48.13%	109	6.19%	35	1.99%	49	2.78%	0	0.00%	595	33.77%	126	7.15%	918	52.10%
I	Block Group 2, Tract 9102.01, LA	1,348	664	49.26%	52	3.86%	0	0.00%	0	0.00%	0	0.00%	576	42.73%	56	4.15%	809	60.01%
I, K	Block Group 3, Tract 9203.35, LA	2,043	1,012	49.53%	14	0.69%	0	0.00%	0	0.00%	20	0.98%	811	39.70%	186	9.10%	1,678	82.13%
I	Block Group 1, Tract 9007.04, LA	2,767	1,383	49.98%	893	32.27%	10	0.36%	114	4.12%	0	0.00%	207	7.48%	160	5.78%	526	19.01%
	Total	**342,267**	**249,018**	**72.80%**	**23,286**	**6.80%**	**2,572**	**0.80%**	**16,035**	**4.70%**	**615**	**0.20%**	**34,233**	**10.00%**	**16,508**	**4.80%**	**76,358**	**22.30%**

Note: Shaded rows indicate Block Groups that are common to all three Alternatives.

TABLE EJ-2. SUMMARY OF POTENTIALLY AFFECTED CENSUS BLOCK GROUPS

EJ-2.A. LOW-INCOME POPULATIONS ALTERNATIVE 1 (OVER 22 PERCENT OF TOTAL UNDER POVERTY THRESHOLD)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
A, B, C	Block Group 1, Tract 59, Kern	850	$8,756	850	416	48.94%	517	60.82%
A, B, C	Block Group 3, Tract 59, Kern	1,518	$13,242	1,482	532	35.90%	743	50.13%
A, B, C	Block Group 3, Tract 60.04, Kern	97	$7,660	97	32	32.99%	70	72.16%
D	Block Group 3, Tract 9200.36, LA	542	$17,576	534	165	30.90%	199	37.30%
A, B, C	Block Group 2, Tract 59, Kern	898	$12,448	898	253	27.17%	429	47.77%
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.33%	343	42.03%
D	Block Group 1, Tract 2, Ventura	1,249	$12,498	1,249	305	24.40%	569	45.60%
D	Block Group 2, Tract 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, D, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.65%	509	31.27%
	Total	**154,737**	**n/a**	**146,609**	**10,536**	**7.20%**	**18,198**	**12.40%**
	Kern County	661,645		630,771	130,949	20.8%	173,090	27.4%
	Los Angeles County	9,519,338		9,349,771	1,674,599	17.9%	2,232,000	23.9%
	Kern and Los Angeles counties combined	10,180,983		9,980,542	1,805,548	18.1%	2,405,090	24.1%
	California	33,871,648		33,100,044	4,706,130	14.2%	6,354,171	19.2%

EJ-2.B. LOW-INCOME POPULATIONS ALTERNATIVE 2 (OVER 22 PERCENT OF TOTAL UNDER POVERTY THRESHOLD)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
A, B, C	Block Group 1, Tract 59, Kern	850	$8,756	850	416	48.90%	517	60.82%
A, B, C	Block Group 3, Tract 59, Kern	1,518	$13,242	1,482	532	35.90%	743	50.13%
A, B, C	Block Group 3, Tract 60.04, Kern	97	$7,660	97	32	33.00%	70	72.16%
G, H, I, K	Block Group 3, Tract 9200.36, LA	542	$17,576	534	165	30.90%	199	37.30%
B, Brunet, F, H, I	Block Group 2, Tract 9009, LA	540	$13,727	532	163	30.60%	270	50.80%
A, B, C	Block Group 2, Tract 59, Kern	898	$12,448	898	253	28.20%	429	47.80%
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.30%	343	42.00%
G, H, I, K	Block Group 2, Tract 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.70%	509	31.30%
	Total	**173,656**	**n/a**	**164,608**	**10,536**	**6.90%**	**20,144**	**12.20%**

EJ-2.C. LOW-INCOME POPULATIONS: ALTERNATIVE 3 (OVER 22 PERCENT OF TOTAL UNDER POVERTY THRESHOLD)

Link	Block Group, Tract, County	Total Population	$ Per capita income in 1999	Total for Whom Poverty Status Was Determined	Income Below Poverty	Percent Below Poverty Level	Income Below 150% of Poverty Level	Percent Below 150% of Poverty Level
I	Block Group 1, Tract 9105.01, LA	1,595	$8,444	1,595	640	40.10%	1,015	63.60%
I	Block Group 2, Tract 9102.01, LA	1,348	$10,257	1,327	516	38.90%	814	61.30%
I, K	Block Group 3, Tract 9203.35, LA	2,043	$9,749	2,037	785	38.50%	893	43.80%
I	Block Group 1, Tract 9104.03, LA	2,310	$8,186	2,287	822	35.90%	1,441	63.00%
A, B, C	Block Group 3, Tract 59, Kern	1,518	$13,242	1,482	532	35.90%	743	50.10%
I	Block Group 2, Tract 9105.02, LA	1,698	$10,448	1,678	577	34.40%	792	47.20%
A, B, C	Block Group 3, Tract 60.04, Kern	97	$7,660	97	32	33.00%	70	72.20%
G, H, I, K	Block Group 3, Tract 9200.36, LA	542	$17,576	534	165	30.90%	199	37.30%
I	Block Group 1, Tract 9007.04, LA	2,767	$15,263	2,750	846	30.80%	1,329	48.30%
B, Brunet, F, H, I	Block Group 2, Tract 9009, LA	540	$13,727	532	163	30.60%	270	50.80%
I	Block Group 1, Tract 9105.02, LA	1,762	$10,521	1,753	524	29.90%	917	52.30%
A, B, C	Block Group 2, Tract 59, Kern	898	$12,448	898	253	28.20%	429	47.80%
A	Block Group 1, Tract 52.02, Kern	826	$17,248	816	223	27.30%	343	42.00%
I	Block Group 1, Tract 9105.03, LA	2,160	$12,254	2,160	588	27.20%	728	33.70%
I	Block Group 6, Tract 9010.06, LA	1,535	$10,009	1,521	407	26.80%	569	37.40%
I	Block Group 1, Tract 9104.04, LA	1,190	$13,458	1,114	273	24.50%	400	35.90%
I	Block Group 1, Tract 9102.05, LA	1,148	$31,624	1,148	277	24.10%	347	30.20%
G, H, I, K	Block Group 2, Tract 9200.38, LA	2,073	$16,614	2,073	498	24.00%	957	46.20%
A, B, C, E	Block Group 4, Tract 60.05, Kern	1,635	$16,226	1,628	385	23.70%	509	31.30%
I	Block Group 1, Tract 9104.02, LA	1,892	$10,399	1,892	445	23.50%	707	37.40%
	Total	**339,452**	**n/a**	**323,499**	**32,465**	**10.00%**	**52,903**	**16.40%**
	Kern County	661,645		630,771	130,949	20.8%	173,090	27.4%
	Los Angeles County	9,519,338		9,349,771	1,674,599	17.9%	2,232,000	23.9%
	Kern and Los Angeles counties combined	10,180,983		9,980,542	1,805,548	18.1%	2,405,090	24.1%
	California	33,871,648		33,100,044	4,706,130	14.2%	6,354,171	19.2%

EJ-2.D. MINORITY POPULATIONS: ALTERNATIVE 1 (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
D	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.40%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	36.10%	0	0.00%	15	15.50%	42	43.30%	0	0.00%	0	0.00%	5	5.20%	0	0.00%
D	Block Group 1, Tract 2, Ventura	1,249	484	38.8%	8	0.6%	76	6.1%	5	0.4%	0	0.00%	593	47.5%	83	6.6%	1,038	83.1%
	Total	**153,647**		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**
	Kern County	661,645	406,392	61.4%	38,804	5.9%	9,014	1.4%	21,562	3.3%	778	0.1%	155,595	23.5%	29,500	4.5%	254,059	38.4%
	Los Angeles County	9,519,338		48.6%	916,907	9.6%	68,471	0.7%	1,134,263	11.9%	27,221	0.3%	2,262,925	23.8%	486,792	5.1%	4,243,487	44.6%
	Kern and Los Angeles counties combined	10,180,983		49.4%	955,711	9.4%	77,485	0.8%	1,155,825	11.4%	27,999	0.3%	2,418,520	23.8%	516,292	5.1%	4,497,546	44.2%
	California	33,871,648	20,122,959	59.4%	2,219,190	6.6%	312,215	0.9%	3,682,975	10.9%	113,858	0.3%	5,725,844	16.9%	1,694,607	5.0%	10,969,132	32.4%

EJ-2.E. MINORITY POPULATIONS: ALTERNATIVE 2 (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
G, H, I, K	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.40%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	36.10%	0	0.00%	15	15.50%	42	43.30%	0	0.00%	0	0.00%	5	5.20%	0	0.00%
	Total	**171,828**	**134,699**	**78.40%**	**7,575**	**4.40%**	**1,130**	**0.70%**	**8,932**	**5.20%**	**334**	**0.20%**	**11,985**	**7.00%**	**7,173**	**4.20%**	**32,101**	**18.70%**

EJ-2.F. MINORITY POPULATIONS: ALTERNATIVE F (OVER 50 PERCENT NON-WHITE/NON-HISPANIC POPULATION)

Link	Block Group, Tract, County	Total Population	White Alone		Black or African American Alone		American Indian and Alaska Native Alone		Asian Alone		Native Hawaiian and Other Pacific Islander Alone		Some Other Race Alone		Two or More Races		Hispanic or Latino	
			Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
G, H, I, K	Block Group 1, Tract 9200.27, LA	19	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%	13	68.42%
I	Block Group 1, Tract 9104.02, LA	1,892	468	24.74%	485	25.63%	37	1.96%	8	0.42%	0	0.00%	742	39.22%	152	8.03%	1,103	58.30%
I	Block Group 3, Tract 9105.01, LA	1,932	503	26.04%	565	29.24%	64	3.31%	0	0.00%	0	0.00%	682	35.30%	118	6.11%	1,125	58.23%
Brunet, F, H, I	Block Group 1, Tract 9010.03, LA	5,008	1,618	32.31%	1,656	33.07%	222	4.43%	277	5.53%	16	0.32%	998	19.93%	221	4.41%	1,498	29.91%
I	Block Group 2, Tract 9105.01, LA	1,960	642	32.76%	563	28.72%	0	0.00%	0	0.00%	0	0.00%	598	30.51%	157	8.01%	1,022	52.14%
I	Block Group 2, Tract 9104.02, LA	1,881	635	33.76%	357	18.98%	0	0.00%	0	0.00%	0	0.00%	842	44.76%	47	2.50%	1,215	64.59%
A, B, C	Block Group 3, Tract 60.04, Kern	97	35	36.08%	0	0.00%	15	15.46%	42	43.30%	0	0.00%	0	0.00%	5	5.15%	0	0.00%
I	Block Group 1, Tract 9101, LA	1,450	608	41.93%	7	0.48%	37	2.55%	37	2.55%	0	0.00%	704	48.55%	57	3.93%	1,113	76.76%
I	Block Group 1, Tract 9105.01, LA	1,595	698	43.76%	292	18.31%	0	0.00%	7	0.44%	0	0.00%	581	36.43%	17	1.07%	891	55.86%
I	Block Group 1, Tract 9104.03, LA	2,310	1,028	44.50%	392	16.97%	62	2.68%	0	0.00%	19	0.82%	783	33.90%	26	1.13%	1,656	71.69%
I	Block Group 1, Tract 9010.05, LA	1,642	764	46.53%	403	24.54%	0	0.00%	90	5.48%	0	0.00%	334	20.34%	51	3.11%	487	29.66%
I	Block Group 1, Tract 9105.02, LA	1,762	848	48.13%	109	6.19%	35	1.99%	49	2.78%	0	0.00%	595	33.77%	126	7.15%	918	52.10%
I	Block Group 2, Tract 9102.01, LA	1,348	664	49.26%	52	3.86%	0	0.00%	0	0.00%	0	0.00%	576	42.73%	56	4.15%	809	60.01%
I, K	Block Group 3, Tract 9203.35, LA	2,043	1,012	49.53%	14	0.69%	0	0.00%	0	0.00%	20	0.98%	811	39.70%	186	9.10%	1,678	82.13%
I	Block Group 1, Tract 9007.04, LA	2,767	1,383	49.98%	893	32.27%	10	0.36%	114	4.12%	0	0.00%	207	4.48%	160	5.78%	526	19.01%
	Total	**342,267**	**249,018**	**72.80%**	**23,286**	**6.80%**	**2,572**	**0.80%**	**16,035**	**4.70%**	**615**	**0.20%**	**34,233**	**10.00%**	**16,508**	**4.80%**	**76,358**	**22.30%**

Note: Shaded rows indicate Block Groups that are common to all three Alternatives.

APPENDIX H: BIOLOGICAL ASSESSMENT

EXECUTIVE SUMMARY

The City of Los Angeles Department of Water and Power (LADWP) is proposing to construct the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access renewable energy resources in the Tehachapi Mountains and Mojave Desert areas. The proposed Project would transmit renewable energy resources to high load demand areas, improve system reliability, and upgrade the transmission capacity.

LADWP, the U.S. Department of Agriculture, Forest Service (USFS or Forest Service), and the U.S. Department of the Interior, Bureau of Land Management (BLM) are preparing a joint Environmental Impact Statement (EIS) / Environmental Impact Report (EIR) for the proposed BRRTP.

The purpose of this Biological Assessment (BA) is to address the potential effect of the BRRTP on species listed under the Endangered Species Act (ESA) as endangered or threatened and/or their designated critical habitat.

Early coordination and pre-consultation with the U.S. Fish and Wildlife Service (USFWS or Service) was conducted during a series of meetings and phone conversations (Appendix A). After consultation with the Service, a list of sixteen species that may be affected by the Project was produced (species list # 2008-SL-0346, dated May 1, 2008). This Biological Assessment addresses the effects of the proposed Project on these sixteen species listed in Table ES-1.

TABLE ES-1. SPECIES POTENTIALLY AFFECTED

Common Name	Scientific Name	Federal Status	Presence in Project Site
PLANTS			
California orcutt grass	*Orcuttia californica*	Endangered	Absent
Nevin's barberry	*Berberis nevinii*	Endangered	Known to occur
Slender-horned spineflower	*Dodecahema leptoceras*	Endangered	Potential to occur
Spreading navarretia	*Navarretia fossalis*	Threatened	Absent
BIRDS			
California condor	*Gymnogyps californianus*	Endangered	Present
Coastal California gnatcatcher	*Polioptila californica*	Threatened, Critical Habitat	Present
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered, Critical Habitat	Potential to occur
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Present
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Potential to occur
REPTILE			
Desert Tortoise	*Gopherus agassizii*	Threatened	Present

Common Name	Scientific Name	Federal Status	Presence in Project Site
AMPHIBIANS			
California red-legged frog	*Rana draytonii*	Threatened, Critical Habitat	Potential to occur
Arroyo toad	*Anaxyrus californicus*	Endangered, Critical Habitat	Potential to occur
FISH			
Unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	Endangered	Potential to occur
INVERTEBRATES			
Riverside fairy shrimp	*Streptocephalus woottoni*	Endangered	Absent
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	Absent

This BA, prepared by the BLM, USFS, LADWP and POWER Engineers, Inc. (POWER), addresses the Proposed Action in compliance with Section 7 of the ESA. Section 7 ensures that, through consultation (or conferencing for proposed species) with the Service, federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat. Species Best Management Practices (USFS/BLM/LADWP 2011) would be incorporated in the Plan of Development (POD) that would directly and indirectly benefit the listed ESA species and reduce impacts. In addition to the Project design measures, specific mitigation measures are proposed to reduce impacts to biological resources (Section 4.5).

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The City of Los Angeles Department of Water and Power (LADWP) is proposing the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access clean, renewable resources in the Tehachapi Mountains and Mojave Desert areas, and to improve reliability and upgrade transmission capacity.

The LADWP is the nation's largest municipal utility and serves approximately four million people. Its service territory covers the City of Los Angeles and certain parts of the Owens Valley, with annual sales exceeding 24 million megawatt-hours (MWh). LADWP has an annual electrical demand of 6,200 megawatts (MW). To maintain a reliable electrical system, it must obtain a system reserve requirement of 1,200 MW; therefore, LADWP must generate 7,400 MW per year.

The State of California has one of the most aggressive renewable energy programs in the country and has established a Renewable Portfolio Standard (RPS) policy requiring the increased production and use of renewable energy (such as wind, solar, small hydroelectric, biomass, and geothermal energy). As a component to its Integrated Resource Plan (IRP), LADWP has also adopted an RPS policy that matches the State's.

In addition, in 2006, California Senate Bill (SB) 1368 required utility companies to establish a greenhouse gas emission (GHGs) performance standard and implement regulations for all long-term commitments in electrical energy generation. California Assembly Bill 32, the Global Warming Solutions Act of 2006, required the California Air Resources Board (CARB) to develop regulations to reduce California's GHG emissions to 1990 levels by 2020.

To achieve a more environmentally sustainable energy resource mix and meet RPS goals and reduce GHGs, LADWP must access renewable energy sources. Most of the renewable sources are located in more remote areas such as the Owens Valley, Mojave Desert, Tehachapi Mountains, and Imperial Valley areas of Southern California where limited electrical infrastructure exists. To meet RPS goals and increase use of renewable energy, investment in new transmission is needed to access renewable resource areas and deliver the renewable energy to the electrical demand areas. To meet the Project needs, LADWP has the following purpose and need, in accordance with the National Environmental Policy Act (NEPA), or objectives, in accordance with the California Environmental Quality Act (CEQA):

- Reduce the environmental impacts associated with greenhouse gas emissions and create a more sustainable environment.
- Assist LADWP in meeting RPS goals.
- Meet LADWP's future electrical energy demands.
- Allow interconnection and expansion of LADWP's renewable energy in the Tehachapi Mountains and Mojave Desert areas.
- Increase LADWP's system reliability and flexibility in the utilization of renewable energy sources.
- Enable the delivery of renewable energy.

LADWP, the U.S. Department of Agriculture, Forest Service (USFS or Forest Service) and the U.S. Department of the Interior, Bureau of Land Management (BLM) are preparing a joint Environmental Impact Statement (EIS) / Environmental Impact Report (EIR) for the proposed BRRTP. LADWP is the CEQA Lead Agency, while the USFS and BLM are the federal Co-Lead Agencies under NEPA. An EIS/EIR is an informational disclosure document used to inform agency decision makers and the public of the potential significant environmental effects of a project, identify possible ways to eliminate or minimize the potential significant effects, and describe reasonable alternatives to the proposed action/project.

LADWP prepared an Alternatives Development Report (USFS/BLM/LADWP 2011) to document the development of alternatives and determine which alternatives would be considered for full analysis in the EIS/EIR. A range of alternatives was identified through a siting and routing evaluation, the scoping process, and supplemental studies and consultations. Each Lead Agency (USFS, BLM and LADWP) has its own purposes to consider in evaluating a proposed project/action and the alternatives to the proposed project/action. NEPA (CFR Title 40 Section 1502.13) and CEQA (Guidelines Section 15124(b)) explain that an agency's statement of objectives or purpose and need should describe the underlying purpose of the proposed project or need for action. Each agency's jurisdiction is unique, and the decision it is called upon to make is also unique; thus, each agency's statement of objectives or purpose and need is different. Based upon review of potential impact characterizations, significant and unavoidable adverse effects, agency and public comments, and a consideration of cumulative impacts of the alternative routes, the BLM, USFS, and LADWP identified Alternative 2, also LADWP's Proposed Action, as the agency preferred alternative. Therefore, the preferred 230 kV Alternative, Alternative 2 (Proposed Action), has been carried forward for evaluation in this Biological Assessment (BA).

This BA, prepared by the BLM, USFS, LADWP and POWER Engineers, Inc. (POWER), evaluates the proposed action in compliance with Section 7 of the Endangered Species Act (ESA). According to 50 CFR § 402.02 pursuant to Section 7 of the ESA, the "action area" means all areas to be affected directly or indirectly by the federal action. Subsequent analyses of the environmental baseline, effects of the action, and cumulative effects are based upon the proposed action area. Potential impacts of the proposed action area are discussed separately for each Project component, including (Figure 1):

1) Construction of approximately 61 miles of a new 230 kilovolt (kV) double-circuit transmission line from the LADWP Barren Ridge Switching Station to Haskell Canyon;
2) Addition of approximately 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant;
3) Reconductoring of approximately 76 miles of the existing Barren Ridge-Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and the Rinaldi Substation;
4) Construction of a new switching station in Haskell Canyon;
5) Expansion of the existing Barren Ridge Switching Station.

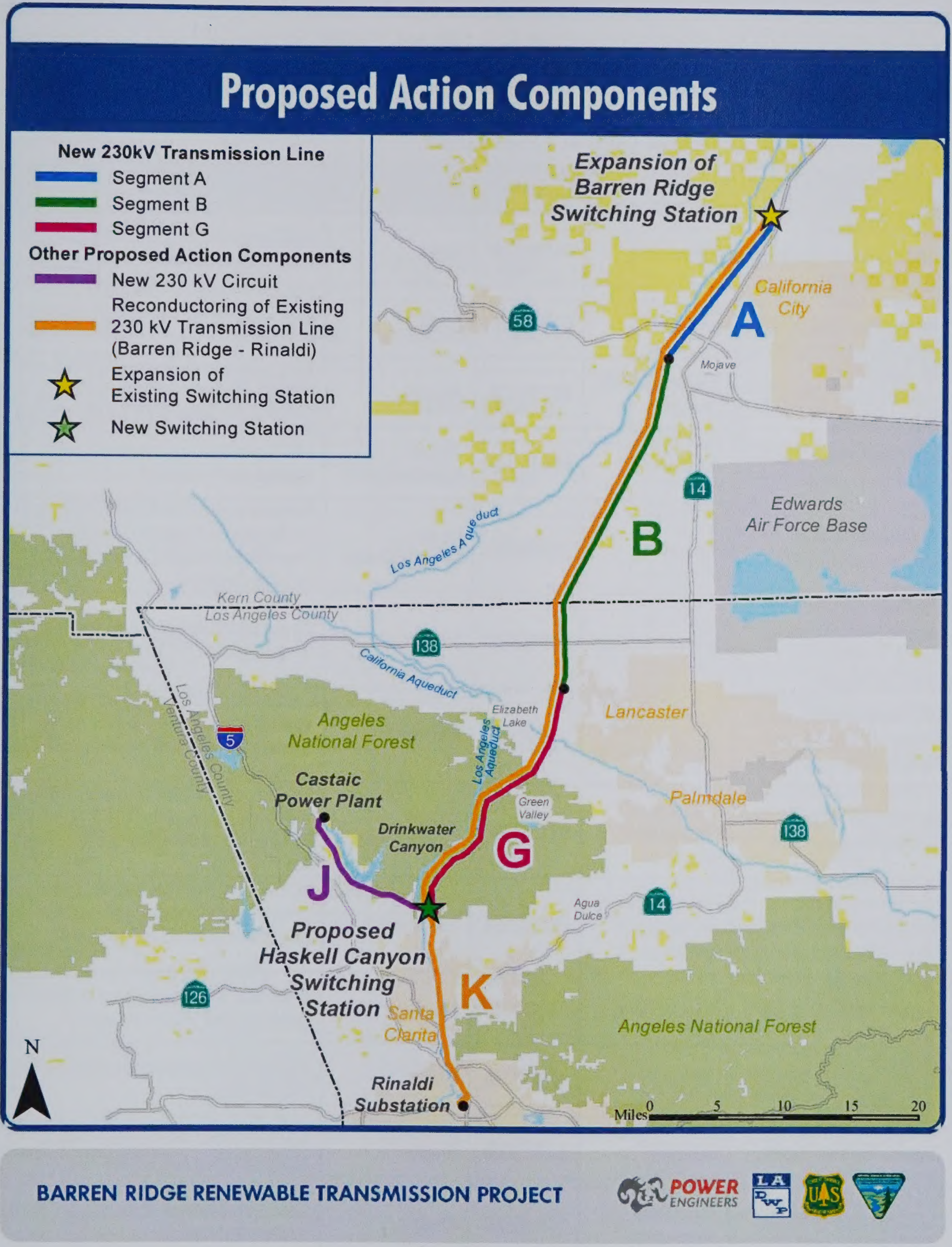
The purpose of this BA is to address the effect of the BRRTP on species listed as endangered or threatened under the ESA, or their designated critical habitat. Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 et seq.) states: "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section."

1.2 PROJECT AREA

The proposed Project is located within northern Los Angeles County and southern Kern County, California. The Project area under evaluation is bounded by the southern slopes of the Tehachapi Mountains in the north, State Route 14 in the east, the Santa Clara River in the south, and Interstate 5 in the west. The Proposed Action extends from the Barren Ridge Switching Station and runs south, paralleling LADWP's existing 230 kV BR-RIN and 500 kV Pacific Direct Current Intertie (PDCI) transmission lines. It travels south from Mojave, California to the Antelope Valley California Poppy Reserve. It continues south into National Forest System lands, remaining within designated utility corridors, and ends at the proposed Haskell Canyon Switching Station.

The study area for this BA covers approximately 1,280 square miles and includes the action area. As defined above, "action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. From here on, the study area and surrounding actions will be referred to as the action area. The action area is defined as a 500-foot-wide corridor (250 feet on each side of the route centerline) along the Proposed Action 230 kV transmission line route, 230 kV reconductoring line, additional double-circuit to the existing 230 kV line, and the switching station footprint. The action area for the Proposed Action 230 kV transmission line route also included a five-mile corridor in areas that had potential to indirectly impact aquatic species or riparian habitat. Figure 1 provides a map of the vicinity of the Project area and Project components, including preliminary routing segment labels, which are used throughout this document to identify specific action areas.

FIGURE 1. BRRTP COMPONENTS AND ACTION AREA


Proposed Action Components
New 230kV Transmission Line
Segment A
Segment B
Segment G
Other Proposed Action Components
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
California City
A
58
Mojave
14
Edwards Air Force Base
B
Los Angeles Aqueduct
Kern County
Los Angeles County
138
California Aqueduct
Elizabeth Lake
Lancaster
Angeles National Forest
5
Los Angeles County
Ventura County
Castaic Power Plant
Drinkwater Canyon
Green Valley
Palmdale
138
G
J
Agua Dulce
14
Proposed Haskell Canyon Switching Station
126
K
Santa Clarita
Angeles National Forest
N
Rinaldi Substation
Miles 0 5 10 15 20
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

2.0 CONSULTATION WITH OTHERS

Early coordination and pre-consultation with the U.S. Fish and Wildlife Service (USFWS) was conducted during a series of meetings and phone conversations. A summary of the coordination and consultation to date is provided below (Table 1).

TABLE 1. BRRTP FEDERAL CONTACT SUMMARIES

Agency	Study Component	Date	Type of Contact	Summary
US Forest Service, Angeles National Forest, Janet Nickerman	Species list	01/09/2008	Email	USFS provided Angeles National Forest sensitive species list.
Bureau of Land Management, Ridgecrest Field Office, Shelly Ellis	Species list	03/06/2008	Email	BLM provided their sensitive species list.
US Forest Service, Angeles National Forest, Arcadia Office	Sensitive Wildlife Species	03/25/2008	Meeting	Discussed sensitive wildlife species and habitat, survey needs, survey approach and potential impact of transmission line.
US Forest Service, Marian Kadota	Plant Management Plans	04/01/2008	Written Communication	USFS provided copies of USFS plant management guides.
US Fish and Wildlife Service, Ventura Office	Species list	04/02/2008	Written Communication	Request for Special-Status Species List for the Barren Ridge Renewable Transmission Project, Kern and Los Angeles Counties.
US Forest Service, Angeles National Forest, Nancy Sandburg and Janet Nickerman	Survey Approach	04/03/2008	Email	Requested review of survey approach for the BRRTP.
US Forest Service, Angeles National Forest, Arcadia Office	Sensitive Plant Species	04/04/2008	Meeting	Discussed sensitive plant and invasive species in action area, survey needs, survey approach and potential impact of transmission line.
US Fish and Wildlife Service, Ventura Office	Species list	05/01/2008	Written Communication	USFWS provided list of species fulfilling the requirements of the USFWS under Section 7(c) of the Endangered Species Act.
US Fish and Wildlife Service, Ventura Office, Chris Dellith	Protocol Surveys for Amphibian species	05/08/2008	Telephone	USFWS reviewed the amphibian site assessment report and gave verbal approval to proceed with protocol surveys.
US Forest Service, Angeles National Forest, Katie VinZant	Botany Surveys	05/08/2008	Meeting	Discussed the Botany Surveys, Seed Collection and use of Herbicides.
US Forest Service, Angeles National Forest, Ann M Berkley	GIS data	05/09/2008	Email	Spotted Owl shapefiles provided for the Project Area.
US Forest Service, Angeles National Forest, Ann M Berkley	GIS data	05/12/2008	Email	USFS provided Arroyo Toad and CA red-legged frog GIS habitat data.
US Forest Service, Angeles National Forest, Justin Seastrand	Avian Risk Assessment	05/12/2008	Email	USFS provided a draft avian risk assessment report.

Agency	Study Component	Date	Type of Contact	Summary
US Fish and Wildlife Service, Ventura Office, Ashleigh Blackford	Desert Tortoise	05/20/2008	Telephone	Discussed habitat assessment for desert tortoise and USFWS recommended survey approach.
US Forest Service, Angeles National Forest, Nancy Sandburg	Fauna and Flora Records	06/06/2008	Email	USFS provided Flora and Fauna spreadsheet for recording data.
US Fish and Wildlife Service, Ventura Office, Della Snyder-Velto	Wildlife Species	06/12/2008	Telephone	Discussed survey needs and wildlife in action area.
US Fish and Wildlife Service, Ventura Office, Della Snyder Velto	Unarmored three-spine stickleback	06/12/2008	Email	Discussed analyzing effects of the action to UTS.
US Forest Service, Angeles National Forest, Katie VinZant	Botany reports	06/20/2008	Email	USFS provided template for the ANF requirements for botany reports.
US Fish and Wildlife Service, Arcadia Office. Della Snyder-Velto	Sensitive Species and ESA Section 7	07/17/2008	Meeting	Discussed Biological Surveys, ESA Section 7, Biological Assessment, and Consultations.
US Fish and Wildlife Service, Hopper Mountain NWR Complex, Chris Barr	CA Condor	07/21/2008	Email	USFWS provided zip file containing GIS shapefile of all GPS records since 2005 within the Project area.
US Forest Service, Angeles National Forest, Patricia Krueger	RCAs	07/31/2008	Email	USFS provided Forest Service Handbook on Soil and Water Conservation
Bureau of Land Management, Ridgecrest Field Office, Linn Gum	Mohave ground squirrel	08/01/2008	Email	Discussed the MGS and review of the West Mojave Plan conclusively shows the area of interest for the BRRTP is not contained within the lands designated by MGS conservation area.
US Forest Service, Marian Kadota	CA Condor	08/01/2008	Email	Discussed the Federally listed CA Condor and impact of power line.
US Forest Service, Angeles National Forest, Patti Krueger	Avian Risk Assessment Report	09/04/2008	Email	A request had been submitted to USFS by Power for the missing figures and maps of the Avian Risk Assessment Report USFS provided as an example. Patti indicated that the missing information would not be available until mid-December.
US Forest Service, Angeles National Forest, Nathan Sill	RCAs	09/05/2008	Email	USFS provided additional data regarding the RCAs. This included GIS files, reports and clarification to questions regarding the 5-step process in identifying RCAs for BRRTP
US Fish and Wildlife Service, Della Snyder-Velto	Avian Risk Assessment	09/12/2008	Email	USFWS provided resource contact information to help with locating data and assessing risk for avian species.
USFS, Angeles National Forest, Nathan Sill	RCAs and Biological surveys	10/22/2008	Meeting	Update on the progress of the biological surveys and reports. Also discussed RCA's.
USFS, Angeles National Forest, USFWS, and BLM	RCAs, biological surveys, and USFWS consultations	11/25/2008	Meeting	Discussed results of biological surveys and approach to Section 7 consultations.
USFS, ANF and USFWS	Bio Tech Report, BA and schedule	10/29/2009	Meeting	Discussed Bio tech report comments and BA schedule, including data needs.

Agency	Study Component	Date	Type of Contact	Summary
USFS, ANF	RCAs	12/09/2009	Meeting	Discussed Riparian Conservation Area Surveys
USFS, ANF	RCAs	01/06/2010	Field visit	Field visit with ANF Biologist Nathan Sill to review/refine RCA buffers along Segment G.
ANF, BLM, USFWS	Biological surveys, USFWS consultations	03/18/2010	Meeting	Discussed results of 2009 biological surveys and Biological Assessment
ANF, BLM, USFWS	Biological Assessment, Avian Protection Plan, Section 7 Consultation Schedule	08/24/2010	Meeting	Discussed Biological Assessment and data needs. Also discussed the Avian Protection Plan.
US Fish and Wildlife Service, Della Snyder-Velto	Cumulative analysis and data needs for the biological assessment	03/30/2011	Email	USFWS provided guidelines and examples on how to develop the cumulative impact section

After early consultation with the Service in 2008, a list of sixteen species that may be affected by the Project was produced (species list # 2008-SL-0346, dated May 1, 2008). This Biological Assessment addresses the effects of the proposed Project on these sixteen species listed in Table 2.

TABLE 2. SPECIES POTENTIALLY AFFECTED

Common Name	Scientific Name	Federal Status	Presence in Project Site
PLANTS			
California orcutt grass	*Orcuttia californica*	Endangered	Absent
Nevin's barberry	*Berberis nevinii*	Endangered	Known to occur
Slender-horned spineflower	*Dodecahema leptoceras*	Endangered	Potential to occur
Spreading navarretia	*Navarretia fossalis*	Threatened	Absent
BIRDS			
California condor	*Gymnogyps californianus*	Endangered	Present
Coastal California gnatcatcher	*Polioptila californica*	Threatened, Critical Habitat	Present
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered, Critical Habitat	Potential to occur
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Present
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Potential to occur
REPTILE			
Desert Tortoise	*Gopherus agassizii*	Threatened	Present

Common Name	Scientific Name	Federal Status	Presence in Project Site
AMPHIBIANS			
California red-legged frog	*Rana draytonii*	Threatened, Critical Habitat	Potential to occur
Arroyo toad	*Anaxyrus californicus*	Endangered, Critical Habitat	Potential to occur
FISH			
Unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	Endangered	Potential to occur
INVERTEBRATES			
Riverside fairy shrimp	*Streptocephalus woottoni*	Endangered	Absent
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	Absent

3.0 CURRENT MANAGEMENT DIRECTION

Management direction for threatened, endangered, protected and sensitive species (TEPS) on the Forest comes from the Angeles National Forest Land Management Plan (LMP) adopted by the Record of Decision signed on September 20, 2005 (USFS 2005). Strategic Goals, Program Strategies and Tactics, Standards, and Appendices A-J of the LMP provide guidance on management of wildlife and botany resources.

Specific direction related to protection of TEPS species comes from Standards 11-44 (Record of Decision [ROD] Part 3, pages 6-10). Appendix B (Record of Determination) includes a summary of species guidance recommendations. These species guidance documents include information to assist in the development of project-specific design criteria (summarized from Land Management Plan, Appendix H).

Direction for management of wildlife and botany resources included in the Forest Service Manual includes the following:

3.1 FOREST SERVICE MANUAL (FSM) DIRECTION (T&E SPECIES):

1. Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research activities and programs.
2. Establish through the Forest planning process objectives for habitat management and/or recovery of populations, in cooperation with States, the FWS, and other Federal agencies.
3. Through the Biological Assessment process, review actions and programs authorized, funded, or carried out by the Forest Service to determine their potential for effect on threatened and endangered species and species proposed for listing.
4. Avoid all adverse impacts on threatened and endangered species and their habitat except when it is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the FWS, when an exemption has been granted under the Act, or when the FWS biological opinion recognizes an incidental taking. Avoid adverse impacts on species proposed for listing during the conference period and while their Federal status is being determined.
5. Initiate consultation or conference with the FWS or National Marine Fisheries Service (NMFS) when the Forest Service determines that proposed activities may have an adverse effect on threatened,

endangered, or proposed species or when Forest Service projects are for the specific benefit of a threatened or endangered species.

6. Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species. Protect individual organisms or populations from harm or harassment as appropriate.

3.2 NATIONAL FOREST MANAGEMENT ACT (NFMA) FOR ALL SPECIES

The National Forest Management Act (NFMA) of 1976 states that "fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to ensure its continued existence is well-distributed in the planning area. In order to ensure that viable populations will be maintained, habitat must be provided to support at least a minimum number of reproductive individuals and that habitat must be well-distributed so that those individuals can interact with others in the planning area (36 CFR 219.19).

The regulations also mandate that "all management prescriptions shall provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan" (36 CFR 219.27(a)(6)).

Diversity states in part: "Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species" (36 CFR 219.27(g)).

3.3 LAND MANAGEMENT PLAN STANDARDS

The following standards are taken from Part 3 of the LMP and are applicable to impacts to plants and wildlife as described below for the BRRTP (USFS 2005, Part 3, pages 3 – 13).

- **S4:** Design fuelbreaks in forests to be open; averaging no more than 40 percent crown closure along the center corridor with an understory of grasses, forbs, and small shrubs. Thinning of forests should favor retention of large-diameter trees. Crown closure and understory vegetation increase gradually, moving from the inside toward the outside of the shaded fuelbreak.
- **S6:** Seed to be used on National Forest System lands will be certified to be free of noxious weeds. Where available, only locally collected native seed will be used, or seeds will be used from species that are noninvasive and nonpersistent. When available, wattles, mulch and livestock feed to be used on National Forest System lands will be certified to be free of noxious weeds.
- **S7:** There are extensive areas within and adjacent to the national forests of southern California meeting the definition of Wildland/Urban Interface (WUI) as described in the Healthy Forests Restoration Act of 2003. WUI (as defined by the Act) is a variable width up to 1.5 miles from communities at risk or as defined in individual community fire protection plans. This forest plan further identifies a direct protection buffer (WUI Defense Zone) and an indirect protection buffer (WUI Threat Zone) that fall within the broader definition WUI. A WUI Defense Zone is the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. The WUI Threat Zone is an additional strip of vegetation modified to reduce flame heights and radiant heat. The Threat Zone generally extends approximately 1.25 miles out from the Defense Zone boundary. Yet, actual extents of Threat Zones are based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, and natural barriers to fire and community protection plans, and therefore could extend well beyond the 1.25 mile. The two zones together are designed to make most structures more defendable.

- **S8:** Community protection needs within the WUI Defense Zone take precedence over the requirements of other forest plan direction, including other standards identified in Part 3 of the forest plan. If expansion beyond the 300-foot minimum width of the defense zone is needed due to site-specific conditions, projects will be designed to mitigate effects to other resources to the extent possible.
- **S11:** When occupied or suitable habitat for a threatened, endangered, proposed, candidate or sensitive (TEPCS) species is present on an ongoing or proposed project site, consider species guidance documents (see [LMP Part 3] Appendix H [pages 71 – 75]) to develop project-specific or activity-specific design criteria. This guidance is intended to provide a range of possible conservation measures that may be selectively applied during site-specific planning to avoid, minimize or mitigate negative long-term effects on threatened, endangered, proposed, candidate or sensitive species and habitat. Involve appropriate resource specialists in the identification of relevant design criteria. Include review of species guidance documents in fire suppression or other emergency actions when and to the extent practicable.
- **S12:** When implementing new projects in areas that provide for threatened, endangered, proposed, and candidate species, use design criteria and conservation practices (see [LMP Part 3] Appendix H [pages 71 – 75]) so that discretionary uses and facilities promote the conservation and recovery of these species and their habitats. Accept short-term impacts where long-term effects would provide a net benefit for the species and its habitat where needed to achieve multiple-use objectives.
- **S13:** Manage Critical Biological land use zones so that activities and discretionary uses are either neutral or beneficial for the species and habitats for which the area was established. Accept short-term adverse impacts to threatened, endangered, and proposed species if such impacts will be compensated by the accrual of long-term benefits to habitat for threatened, endangered, and candidate species.
- **S15:** Within riparian conservation areas retain snags and downed logs unless they are identified as a threat to life, property, or sustainability of the riparian conservation area.
- **S18:** Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.
- **S19:** Protect all spotted owl territories identified in the Statewide California Department of Fish and Game database (numbered owl sites) and new sites that meet the state criteria by maintaining or enhancing habitat conditions over the long-term to the greatest extent practicable while protecting life and property. Use management guidelines in the species conservation strategy (or subsequent species guidance document; see [LMP Part 3] Appendix H [pages 71 – 75]) to further evaluate protection needs for projects, uses and activities.
- **S20**: Maintain a limited operating period (LOP) prohibiting activities within approximately .25 miles of a California spotted owl nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15), unless surveys confirm that the owls are not nesting. Follow the USDA Forest Service (1993, 1994 or subsequent) protocol to determine whether owls are nesting. The LOP does not apply to existing road and trail use and maintenance, use of existing developed recreation sites, or existing special-uses, such as recreation residence tracts. When evaluating the need to implement a limited operating period, site- and project-specific factors need to be considered (use species management strategy or subsequent guidance; see [LMP Part 3] Appendix H [pages 71 – 75]).
- **S21:** California spotted owl habitat that is lost to development for a compelling reason should be mitigated up to a two-to-one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special-use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first

within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.

- **S22:** Except where it may adversely affect threatened and endangered species, linear structures such as fences, major highways, utility corridors, bridge upgrades or replacements, and canals will be designed and built to allow for fish and wildlife movement.
- **S24:** Mitigate impacts of on-going uses and management activities on threatened, endangered, proposed, and candidate species.
- **S25:** Conduct road and trail maintenance activities during the season of year that would have the least impact on threatened, endangered, and proposed wildlife species in occupied habitats, except as provided by site-specific consultation.
- **S27:** Use seasonal closures as specified by site-specific analysis to protect occupied bald eagle wintering, breeding, or nesting habitat.
- **S28:** Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites and within 0.5 miles of active roosts. Refer to California condor species account (or subsequent species guidance document; see [LMP Part 3] Appendix H [pages 71 – 75]) for additional guidance.
- **S31:** Design new facilities or expansion of existing facilities to direct public use away from occupied habitat for threatened, endangered, proposed and candidate species.
- **S32:** When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist.
- **S37:** Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles. Mitigate impacts where such use does occur.
- **S38:** Avoid establishment of staging areas, helibases, base camps, firelines or other areas of human concentration and equipment use within threatened, endangered and proposed species suitable and occupied habitats and riparian areas to the maximum extent possible when suppression of wildland fire and human safety are not compromised.

4.0 PROPOSED ACTION

4.1 TRANSMISSION LINE DESIGN AND CONSTRUCTION ACTIVITIES

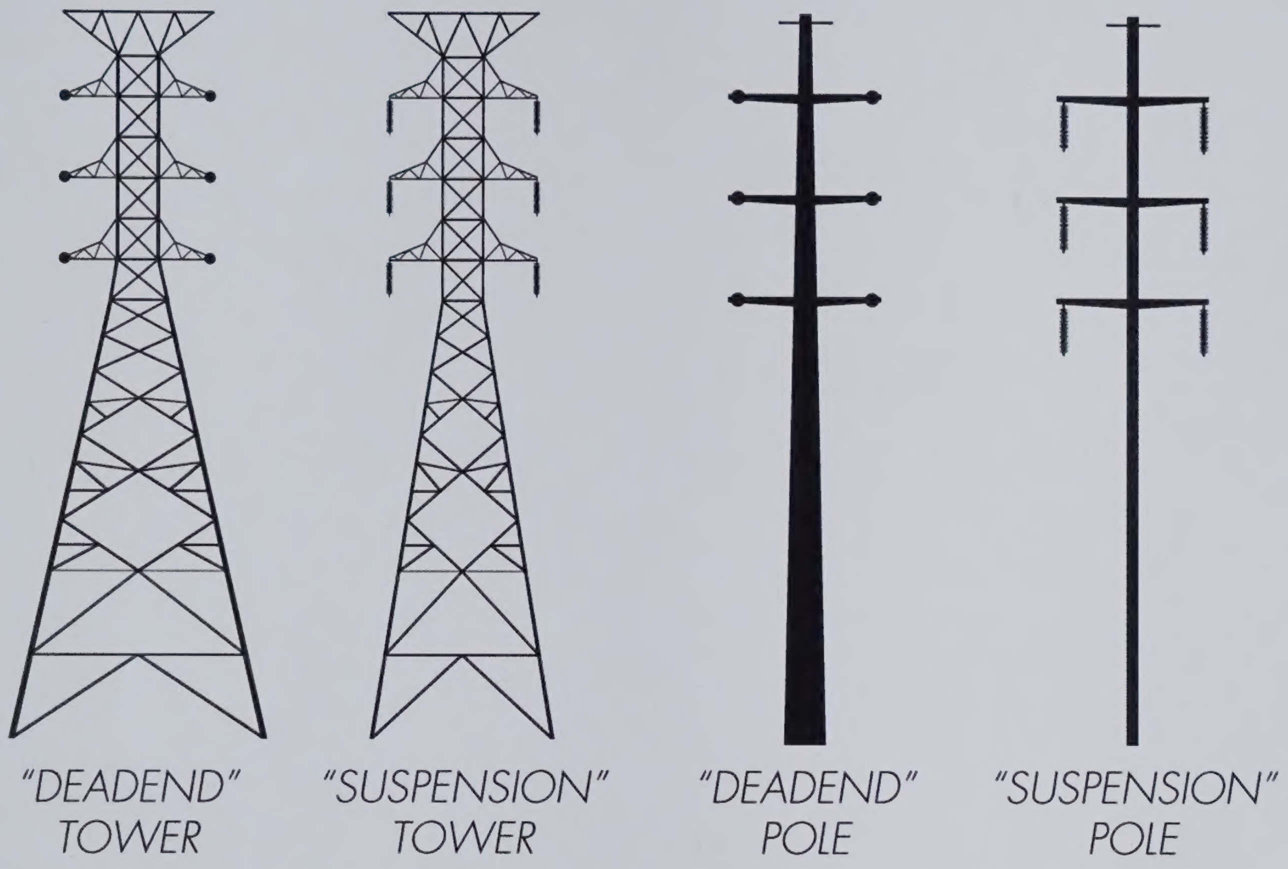
4.1.1 Component 1 – Construction of New 230 kV Double-Circuit Transmission Line

The proposed double-circuit 230 kV transmission line component of the BRRTP would consist of two alternating current (AC) circuits from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station in Haskell Canyon.

The proposed structures for the new transmission line would primarily be self-supporting double-circuit steel lattice towers fabricated from galvanized steel members, as shown on the left side of Figure 2. Depending on the environmental conditions of the surrounding terrain, the height of the proposed lattice structures would range from 110 to 195 feet, with an average tower-to-tower span of 1,000 to 1,100 feet. Appendix F lists the structure specifications for the number of structures per mile, average span length, and average heights for towers and components. Exact structure placement would be determined during engineering surveys and detailed design studies for the selected Alternative route following the Record of Decision (ROD) on the EIS/EIR. A variety of engineering, constructability, existing access, and environmental issues would be considered during detailed structure siting within the permitted right-of-way (ROW).

"Dead-end" towers of self-supporting, steel-lattice design would be required periodically to add longitudinal strength along the line. Dead-end towers would also be used at turn (angle) locations along the line, at heavily loaded tower locations, and at specific utility crossings (e.g., other transmission lines) for added safety. Dead-ended towers are of the same basic configuration as suspension towers (non-angle structures), the difference being in the tower "arms," insulator systems, and tower weights.

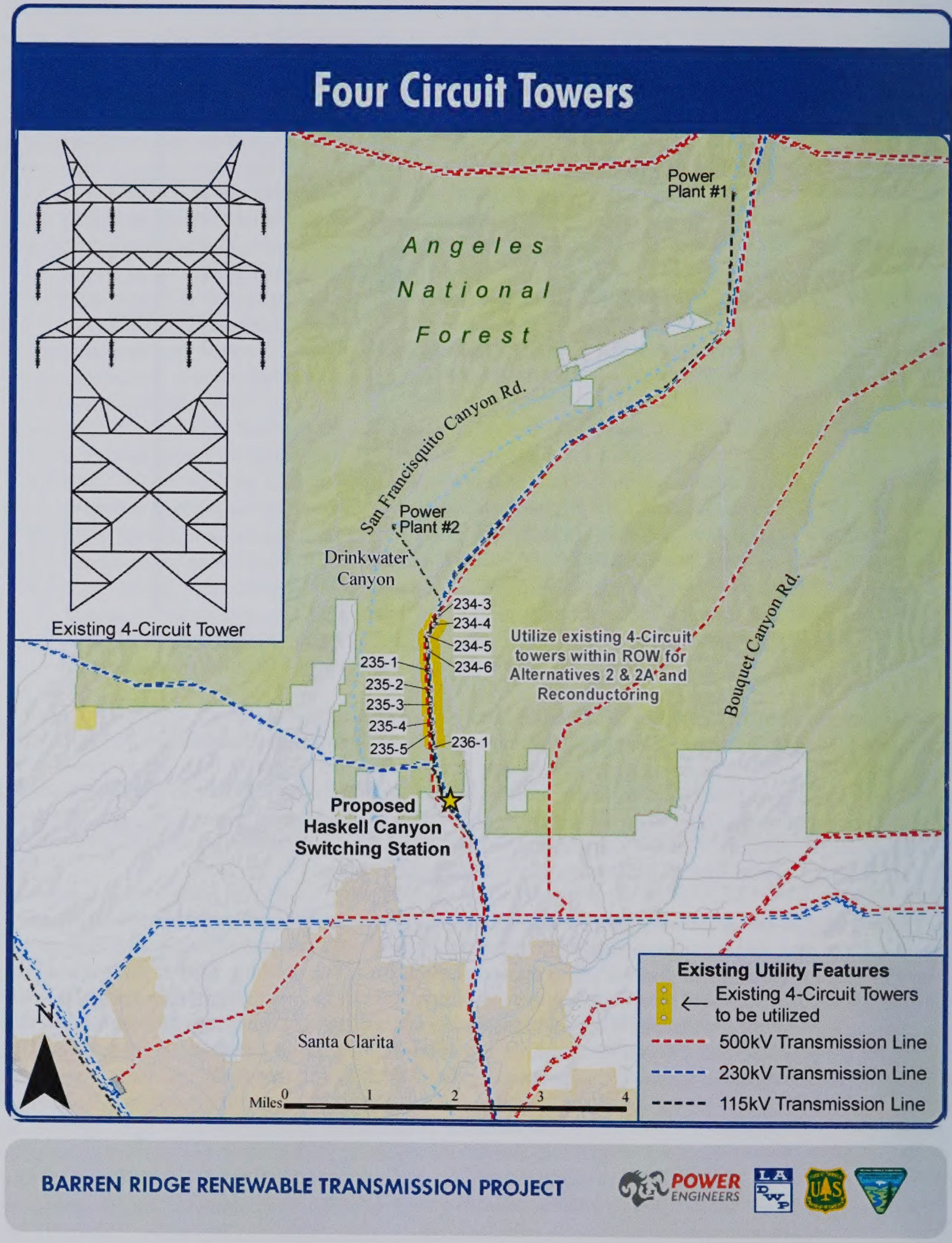
FIGURE 2. TYPES OF TOWERS



Self-supporting, tubular steel poles (TSP) have been proposed by LADWP as an available mitigation structure where appropriate to reduce potential impacts, such as conflicts with cultivation on agricultural lands. The TSPs can reduce impacts in some cases due to a smaller footprint than the proposed self-supporting steel lattice structures; however, more TSPs per mile are necessary due to a shorter average span between structures. The TSPs would have an average height range between 95 and 180 feet, depending on the conditions of the surrounding terrain, with an average tower-to-tower span of 700 to 800 feet. Refer to Figure 2 for an illustration of the double-circuit poles.

For the majority of the alignment, the two new 230 kV circuits would be placed on new double-circuit transmission towers, but for approximately 1.5 miles, the circuits would be placed on existing four-circuit structures that are located just north of the proposed Haskell Canyon Switching Station. Between where the existing BR-RIN crosses Dry Canyon to the intersection of the Castaic transmission lines, LADWP has existing four-circuit towers with three vacant positions. The existing towers would be utilized in this section for the proposed 230 kV double circuit transmission line instead of constructing new towers. See Figure 3 for the location and illustration of the existing four-circuit towers to be utilized.

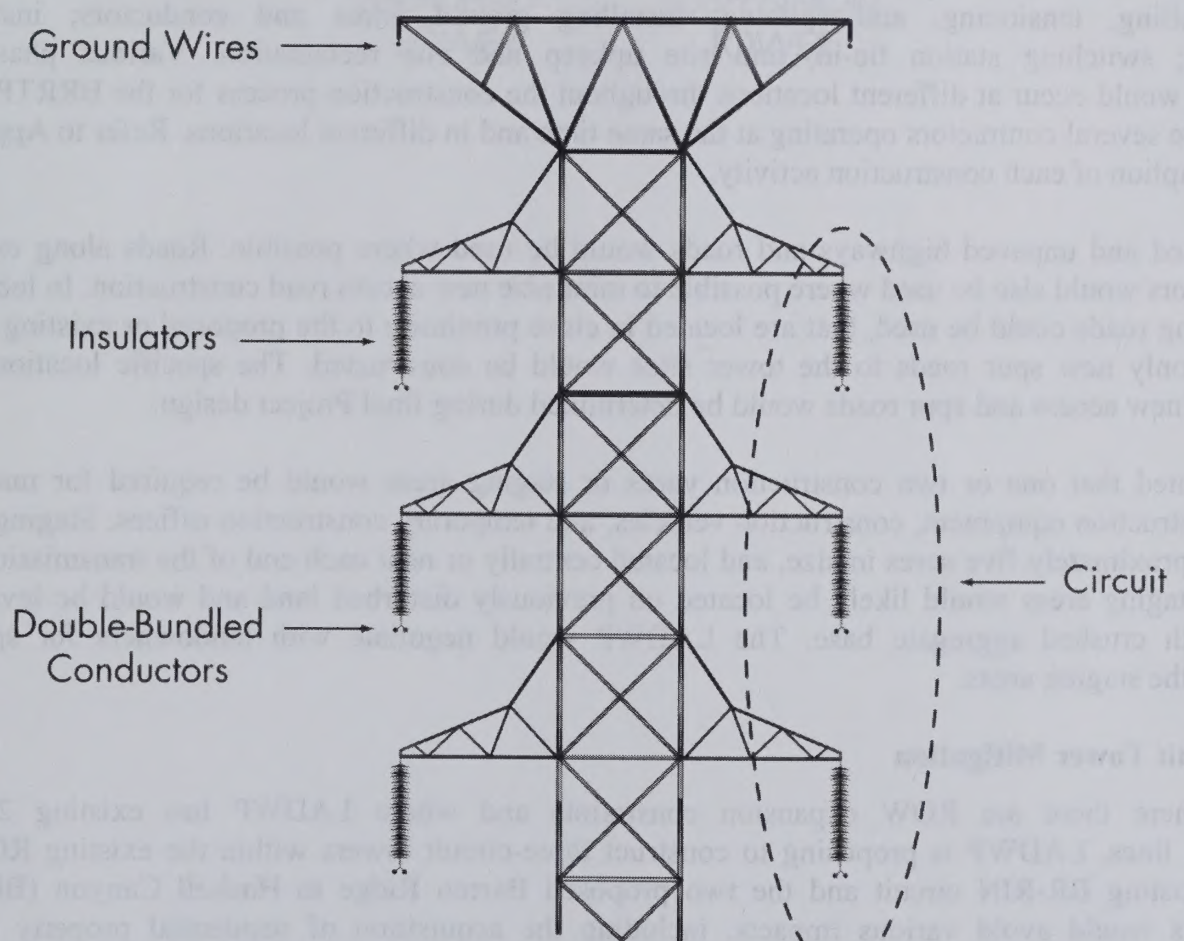
FIGURE 3. FOUR-CIRCUIT TOWERS TO BE UTILIZED


Four Circuit Towers
Existing 4-Circuit Tower
Angeles National Forest
Power Plant #1
Power Plant #2
San Francisquito Canyon Rd.
Drinkwater Canyon
234-3
234-4
234-5
234-6
235-1
235-2
235-3
235-4
235-5
236-1
Utilize existing 4-Circuit towers within ROW for Alternatives 2 & 2A and Reconductoring
Bouquet Canyon Rd.
Proposed Haskell Canyon Switching Station
Santa Clarita
N
Miles 0 1 2 3 4
Existing Utility Features
Existing 4-Circuit Towers to be utilized
500kV Transmission Line
230kV Transmission Line
115kV Transmission Line
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP
US

The self-supporting steel lattice structures and TSPs would utilize concrete foundations. Steel lattice structures would require four footings (one for each leg); TSPs would require single footings. Footings would be steel-reinforced concrete pier type and be cast in place. The typical design for the concrete footings for lattice structures would be between 2.5 and 5.0 feet in diameter, with an average depth of 20 feet depending on soil conditions. Typical design for single foundations for TSPs would include augured holes approximately five to seven feet in diameter and 15 to 30 feet deep, depending on conditions. Formwork steel reinforcing would be assembled in the hole prior to casting concrete in place. Reinforcing steel would become integral to the lower leg of the steel lattice structure during assembly. An above-ground concrete form placed over each hole would result in a final concrete foundation height of 0.5 to 2.0 feet above ground level.

As illustrated in Figure 4, Typical Tower Components, each tower carries conductors ("wires"), insulators, and ground wires. The conductor being considered for the new double-circuit 230 kV transmission line and installation of the Castaic – Haskell Canyon #4 circuit on existing structures is a bundled 715.5 kcmil "Starling" ACSS/AW. The reconductoring of the BR-RIN transmission line between Barren Ridge Switching Station and Rinaldi Substation would require a bundled 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor.

FIGURE 4. TYPICAL TOWER COMPONENTS



Each circuit would consist of three phases ("wires") as illustrated in Figure 4. To increase the current-carrying capability of the transmission lines and reduce power loss, the Proposed Action would utilize bundled conductors installed for each phase. The bundled conductors would consist of two conductor cables connected by a spacer. The new 230 kV double-circuit transmission line would consist of a total of six double-bundled (12 individual) wires.

Minimum conductor height above the ground, under normal operation of the line, is 30 feet. Greater clearances may be required in certain areas to allow for clearances over trees or other vegetation that could pose a risk to the operation of the transmission line. Minimum conductor clearance would dictate the exact height of each tower based on topography and safety clearance requirements.

Insulators are used to provide the physical connection of conductors to structures. These system components are made of very low conducting materials (polymer insulators) that inhibit the flow of electric current from energized conductors to ground or to other energized system elements. Insulators and their associated hardware are to be configured in an "I" assembly to support conductors while maintaining required distances between phases and grounded structures. Each "I" string would consist of six-inch diameter insulators between six and eight feet long.

To shield conductors from hazard of direct lightning strikes by transferring lightning currents into the ground, overhead ground wires (shield wires) or fiber optic ground wire would be installed on top of new structures.

Construction of a transmission line involves the following general sequence of events: surveying activities; identifying and constructing access roads; clearing ROW and tower sites (including construction yards and batch plants); installing foundations; assembling and installing the towers; clearing, pulling, tensioning, and splicing; installing ground wires and conductors; installing counterpoise; switching station tie-in; and site upkeep and site reclamation. Various phases of construction would occur at different locations throughout the construction process for the BRRTP. This would require several contractors operating at the same time and in different locations. Refer to Appendix F for a description of each construction activity.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads could be used, that are located in close proximity to the proposed or existing ROW centerlines, only new spur roads to the tower sites would be constructed. The specific locations and design of all new access and spur roads would be determined during final Project design.

It is anticipated that one or two construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located centrally or near each end of the transmission line route. The staging areas would likely be located on previously disturbed land and would be level and surfaced with crushed aggregate base. The LADWP would negotiate with landowners for specific locations of the staging areas.

Three-Circuit Tower Mitigation

In areas where there are ROW expansion constraints and where LADWP has existing 230 kV transmission lines, LADWP is proposing to construct three-circuit towers within the existing ROW to carry the existing BR-RIN circuit and the two proposed Barren Ridge to Haskell Canyon (BR-HC) circuits. This would avoid various impacts, including the acquisition of residential property in the unincorporated communities of Willow Springs (milepost 27.1 to 27.6), Elizabeth Lake, and Green Valley (milepost 44.6 to 51.7). Refer to Figure 5 for an illustration of three-circuit tower types, and to Figure 6, the Three-Circuit Tower Mitigation Map, for proposed locations.

FIGURE 5. **THREE-CIRCUIT TOWER TYPES**

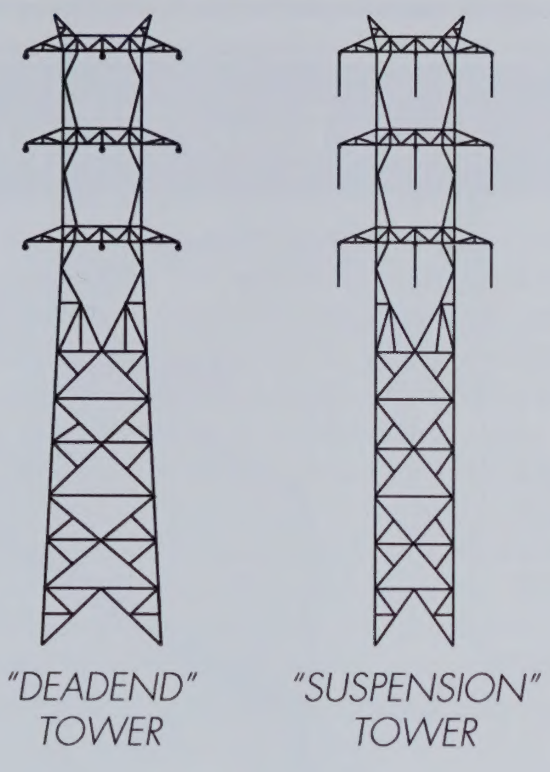
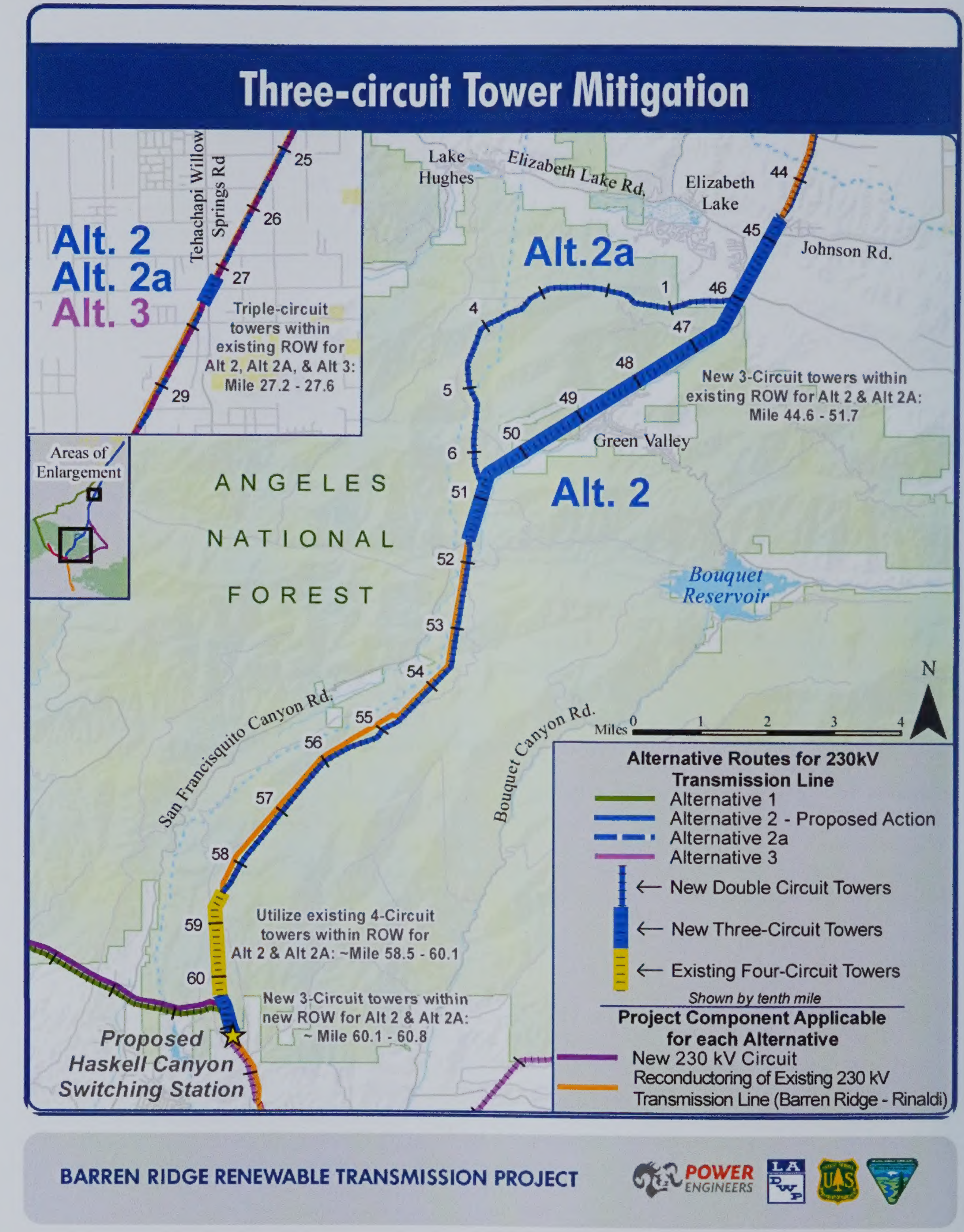

"DEADEND" TOWER
"SUSPENSION" TOWER

FIGURE 6. THREE-CIRCUIT TOWER MITIGATION


Three-circuit Tower Mitigation
Alt. 2
Alt. 2a
Alt. 3
Tehachapi Willow Springs Rd
25
26
27
29
Triple-circuit towers within existing ROW for Alt 2, Alt 2A, & Alt 3: Mile 27.2 - 27.6
Areas of Enlargement
Lake Hughes
Elizabeth Lake Rd.
Elizabeth Lake
Johnson Rd.
Alt.2a
1
4
5
6
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
New 3-Circuit towers within existing ROW for Alt 2 & Alt 2A: Mile 44.6 - 51.7
Green Valley
Alt. 2
ANGELES NATIONAL FOREST
Bouquet Reservoir
San Francisquito Canyon Rd.
Bouquet Canyon Rd.
N
Miles 0 1 2 3 4
Utilize existing 4-Circuit towers within ROW for Alt 2 & Alt 2A: ~Mile 58.5 - 60.1
New 3-Circuit towers within new ROW for Alt 2 & Alt 2A: ~ Mile 60.1 - 60.8
Proposed Haskell Canyon Switching Station
Alternative Routes for 230kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
New Double Circuit Towers
New Three-Circuit Towers
Existing Four-Circuit Towers
Shown by tenth mile
Project Component Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LADWP

LADWP must maintain the electrical service along the existing BR-RIN transmission line to avoid impacts to the hydroelectric power plants north of the Barren Ridge Switching Station. Therefore, a temporary transmission line would be constructed to keep the BR-RIN circuit energized during construction of the three-circuit towers. After the temporary line is constructed, the existing BR-RIN single-circuit towers would be removed to allow the new three-circuit towers to be constructed within the existing ROW. Once construction of the three-circuit towers is completed, the temporary transmission line would be removed.

The temporary transmission line would be 7.5 miles long and would consist of wood and steel single poles with an average height of 95 feet, a 3-foot by 3-foot footprint, and an average of eight poles per mile. Construction would occur within a temporary 80- to 100-foot ROW. The majority of the temporary transmission line would be constructed along San Francisquito Road. Portions would also be constructed along Elizabeth Lake Road and Johnson Road. Pole placement would be adjacent to public roadways wherever possible. If necessary, temporary ROW on private property would be needed where poles could not be placed within public road ROW. The majority of poles would be direct-embedded when set in place and would not require a permanent foundation. Where additional strength is necessary at larger angle points, steel poles would be required, which could require an excavation approximately 6 feet in diameter by 20 feet deep to accommodate the concrete pier foundation that would be cast in place. Once all the poles have been constructed and the conductor installed, the existing BR-RIN circuit would be connected into the temporary line and energized. The construction would require establishment of a staging area, work areas around poles, and pull and tension sites. Access to pole sites and pull and tension sites would be from the adjacent roadways.

Approximately seven miles of the existing BR-RIN single-circuit towers would be removed, with existing ROW utilized to access the existing towers. The new three-circuit towers would be placed within the existing ROW, utilizing existing access roads. Helicopter Mitigation, as described in this section below, would be applied in steeper terrain if additional access is required. The new three-circuit tower would require a 25-foot by 30-foot structure footprint and an average of seven structures per mile; the average structure height would be 170 feet, with a maximum tower-to-tower span length of 780 feet. The construction process for the new three-circuit towers would be the same as the double-circuit towers discussed above. After completion of construction of the three-circuit towers, the temporary transmission line would be removed and all temporary staging and work area land disturbances would be restored as close to previous conditions as possible and revegetated as required.

Helicopter Mitigation

USFS will require helicopter mitigation to access any area more than 300 feet from an existing road and with slopes greater than approximately 25 percent. After a preliminary review of the existing access roads along the Proposed Action, no specific locations for helicopter mitigation have been identified. However, during final design, the USFS helicopter mitigation criteria may be triggered and would be implemented on the Proposed Action. If helicopter mitigation is required on the Proposed Action, the fly yards/staging areas that would serve as helicopter support yards for fueling and maintenance would be located outside areas that have been identified as occupied habitat for listed species or critical habitat. The occupied habitats for listed species and critical habitat locations have been identified along the Proposed Action. Refer to Appendix F.

In the event that USFS helicopter mitigation is triggered during final design, the USFS would require that the new double-circuit 230 kV structures be constructed with the use of helicopters such as the Hughes 500 or Bell 212, or Sikorsky Skycrane. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads. However, this would only occur should an existing road be more than 300 feet away from the new structure location and with slopes greater than 25 percent. Site and ground disturbing construction activities that would be required to construct the new transmission line within potential helicopter construction areas include: portable landing pads, helicopter fly yards/staging areas and associated access roads, tower structure vegetation clearing, guard structures at major crossings, and access road pullouts. The locations of the helicopter ground disturbing activities would be located outside occupied habitat for listed species or critical habitat (refer to Appendix F, Wildlife Map). Below is a discussion of each of these activities.

Temporary 24-foot wide access roads would be required to access the helicopter fly yards/staging areas. The transmission line materials (tower steel, conductor reels, structure hardware, etc.) would be delivered by truck to the helicopter fly yards/staging areas. Vegetation clearing may be required at these sites to ensure safe working conditions. The fly yards/staging areas would serve as helicopter support yards for fueling and maintenance, as well as for the transport of materials and personnel. Towers may also be assembled in sections at these yards prior to delivery to the tower sites. Heavy lift helicopters would then fly the towers from the yards to the tower sites.

Portable landing pads would be located at each tower site. These pads would allow helicopters to load and unload personnel, tools, and equipment necessary for construction of foundations and assembly of tower structures. Helicopter-constructed towers that would not be in close proximity to existing access roads would utilize micropile foundations. For each tower leg, micropile foundations would use a group of three to eight 6- to 9-inch diameter casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth anywhere from one to eight feet below the ground surface, depending on the terrain.

Conductor installation would proceed in the same manner as the double-circuit tower installation. The equipment necessary for conductor installation would be large, heavy construction equipment that could only be brought in by truck. Some National Forest System (NFS) roads could need maintenance or improvement to allow pulling and tensioning, but no new access or spur roads would be created for conductor installation on the helicopter-constructed towers. After project completion, any maintained access roads to helicopter fly yards/staging areas to would be reduced to 16 feet.

4.1.2 Component 2 - Addition of New 230 kV Circuit

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures. The circuit would cross the unincorporated communities of Castaic and Saugus and the city of Santa Clarita. A total of 300 feet of BLM-managed public lands and four miles of NFS lands would be traversed; however, the new circuit would not require a new or additional ROW. This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (bundled 715.5 kcmil “Starling” ACSS/AW [aluminum conductor steel supported/aluminum-clad steel wire]) as that proposed for the new 230 kV transmission line between Barren Ridge and Haskell Canyon Switching Stations.

The addition of a new circuit on existing towers would require many of the same construction activities associated with a new transmission line (refer to Appendix F for a description of each construction activity). However, all work would be within existing ROW and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor. Specific towers requiring reinforcement would be determined following detailed design of the Project. Tower reinforcement would not alter the general design or the location of the structures. This process would generally include reinforced foundations or steel member replacements. Refer to Figure 1 for a map showing the location of the new 230 kV circuit.

4.1.3 Component 3 - Reconductoring of Existing Transmission Line

LADWP proposes the reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station to Rinaldi Substation. Four miles of BLM-managed public lands, 13 miles of NFS lands, and 44 miles of private property would be traversed. The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS (aluminum conductor steel supported/trapezoidal wires/high strength) conductor. The new conductor would have a larger diameter that allows for greater electrical capacity.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). Removal of the existing conductor would be used to string a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing 250-foot-wide ROW, with no additional ROW required. Some of the towers would need to be modified, replaced, and/or have foundations reinforced or replaced to carry the additional weight of the new heavier conductor. Refer to Figure 1 for the location of the reconductoring.

4.1.4 Component 4 - Construction of New Switching Station

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge – Haskell Canyon, existing Castaic – Northridge, Castaic – Sylmar, Castaic – Olive, and the proposed Castaic – Haskell Canyon). Refer to Figure 1 for the location of the new switching station.

The station would be approximately 500 feet by 600 feet to accommodate the necessary circuit positions, which are made up of equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide and would be enclosed by chain-link fencing with barbed-wire extension for security. The preliminary grading plan for the station is located in Appendix F.

Necessary pre-construction geotechnical investigation on-site would include six borings by a drill rig to investigate bedrock and soil stability and four cone penetration test locations after site grading to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. Construction would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut and fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. A 16-foot-wide paved road and a 100-foot by 100-foot gravel parking area would be required. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 120-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would be terminated into the switching station (i.e., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would need support and require the installation of galvanized steel structures. An existing 115 kV transmission line may need to be relocated around the proposed station. High-voltage bus work consisting of aluminum jumpers and tubing would be installed within the station.

4.1.5 Component 5 - Expansion of Existing Switching Station

LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet by 500 feet, for a total station size of 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and a drainage area. The preliminary design layout for the station may be found in Appendix F. Refer to Figure 1 for the location of the existing switching station.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station as described above. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Necessary pre-construction geotechnical on-site investigation would include two test pits excavated by a backhoe to investigate soil density and settlement, and four cone penetration test locations on-site to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

It is estimated that 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 90-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable-welding units, line trucks, and mechanic trucks would also be required. An estimated eight months with approximately 60 workers would be required to expand the station.

4.1.6 Project-Wide Mitigation Measures

To address potential impacts of the Proposed Project to multiple resource areas as discussed above, the following project-wide mitigation measure would be applied:

> Three-Circuit Tower Mitigation (THREE-CIRCUIT) – A three-circuit lattice tower design would be implemented as described in Section 4.1.1 of this report, at the locations shown in Figure 6, Three-Circuit Tower Mitigation Map.
>
> Helicopter Mitigation (HELICOPTER) – Helicopter Mitigation shall be implemented, as described in Section 4.1.1 of this report, in steep areas of the Angeles National Forest where access is limited. During final design of the Project, areas may be identified for helicopter

construction of the towers. This determination would generally be made where tower sites have no existing access roads within 300 feet and slopes are greater than 25 percent. Final identification of these tower sites would be determined and agreed upon by the Forest Service, BLM and LADWP.

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TABLE 3. HELICOPTER MITIGATION ESTIMATED DISTURBANCE

Disturbance Description	Double-Circuit Steel Lattice Towers with Helicopter Stringing		Three-Circuit Tower Mitigation (Three-Circuit Steel Lattice Towers with Helicopter Stringing)				Helicopter Mitigation (Steel Lattice Towers with Helicopter Installation of Towers and Stringing)	
			Three-Circuit		Temporary Transmission Line			
	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance
	Temporary Disturbance During Installation							
Tower installation	200 x 200 feet (0.9 acre) per tower ±5 towers per mile[1]	4.6 acres per mile	200 x 200 feet (0.9 acre) per tower ±7 towers per mile	6.4 acres per mile	50 X 100 feet (0.1 acre) per tower ±8 towers per mile	0.9 acre per mile	100 x 100 feet (0.2 acre) per tower ±5 towers per mile	1 acre per mile
Guard structures at major crossings	200 x 300 feet (1.4 acres) One crossing every 5 miles	0.3 acre per mile	200 x 300 feet (1.4 acres) One crossing every 5 miles	0.3 acre per mile	40 X 100 feet (0.09 acres) One crossing every 5 miles	0.02 acre per miles	200 x 300 feet (1.3 acres) One crossing every 5 miles	0.3 acre per mile
Helicopter fly yards / staging areas (includes fueling station at one of the sites)	200 x 200 feet (0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 feet (0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 feet (0.9 acre) One site every 5 miles	0.2 acre per mile	650 x 650 feet (10 acres) One site every 5 miles	2 acres per mile
Landing area/Portable helicopter landing pads (includes vegetation clearing for site)	50 x 50 feet (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 feet (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 feet (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 feet (0.06 acre) per site Five sites per mile	0.3 acre per mile
Pulling and tensioning sites	200 x 500 feet (2.3 acres) per site One site every 2.5 miles[2]	0.9 acre per mile	200 x 500 feet (2.3 acres) per site One site every 2.5 miles	0.9 acre per mile	200 x 500 feet (2.3 acres) per site One site every 2.5 miles	0.9 acre per mile	200 x 500 feet (2.3 acres) per site One site every 2.5 miles	0.9 acre per mile
Sleeving and miscellaneous stringing operations	100 x 200 feet (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	100 x 200 feet (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	50 x 100 feet (0.1 acres) per site One site every 2.5 miles	0.05 acre per mile	100 x 200 feet (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile
Total Average Temporary Disturbance[3]	**6.2 acres per mile**		**8 acres per mile**		**2.1 acres per mile**		**3.7 acres per mile**	
	Permanent Disturbance							
Tower sites, including vegetation clearance within a 10-foot radius around base of towers in accordance with state law	60 X 60 feet (0.08 acres) ±5 towers per mile	0.2 acre per mile	45 x 50 feet (0.05 acre) ±7 towers per mile	0.14 acre per mile	N/A	N/A	60 x 60 feet (0.08 acre) ±5 towers per mile	0.2 acre per mile
Total Average Permanent Disturbance[4]	**0.2 acre per mile**		**0.14 acre per mile**		**N/A**		**0.2 acre per mile**	

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[1] For slopes over 10% (ground disturbance categories 4-6), site dimensions would be 200 x 250 feet (1.2 acres) and have an average disturbance of 5.8 acres per mile.
[2] For slopes over 10% (ground disturbance categories 4-6), sites would be every 2 miles and have an average disturbance of 1.2 acres per mile.
[3] Access and spur road disturbances included in Table 2-4.
[4] Ibid

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4.2 GENERAL PRACTICES AND SPECIFIC MITIGATION MEASURES

The following tables describe proposed General Practices (GPs) and specific mitigation measures to reduce the impact of effects that may be generated by construction of the BRRTP to the biological resources discussed in this BA. These were written in collaboration with ANF and BLM staff and apply to preconstruction, construction, and post-construction aspects of the Project. The GPs were written for all resources of the Project. Because not all of these are applicable to biology, ones that do not apply to listed biological species have been removed and show "not applicable" in the table below. The entire list can be viewed in the BRRTP Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) (USFS, BLM, and LADWP 2011b).

The mitigation measures are specific to biology and are in response to various impacts that could occur to vegetation, wildlife, and/or habitat. Some impacts do not have respective mitigation measures, as noted in Table 5 below. Throughout this document, "biological monitor" refers to a BLM, USFS or CDFG-approved biologist that ensures compliance with protective measures during monitoring of construction, operation or maintenance activities. An "authorized biologist" refers to a USFWS-approved biologist that is authorized to monitor any construction, operation, or maintenance activities that may result in adverse effects to federally listed species. The biological monitor would report to the authorized biologist.

TABLE 4. GENERAL PRACTICES

GP NUMBER	DESCRIPTION
	Plans
GP-1	**Plan of Development & Construction, Operation and Maintenance Plans.** In consultation with the USFS and BLM Authorizing Officers prior to construction, LADWP shall develop a Construction, Operation and Maintenance Plan (COM Plan) with the USFS and Plan of Development (POD) with BLM. These plans shall be attached to and become a part of the Special Use and Right-of-Way Authorizations. The COM Plan and POD shall include, at a minimum, road maintenance specifications, vegetation treatment and rehabilitation specifications, and conditions on maintenance and replacement of improvements and the terms and conditions of the Biological Opinion. The agencies may combine the POD and COM plans into a single document for the Project.
GP-2	Not applicable.
GP-3	Not applicable.
GP-4	Not applicable.
GP-5	Not applicable.
GP-6	Not applicable.
GP-7	Not applicable.
GP-8	**Avian Protection Plan.** An Avian Protection Plan (APP) shall be developed and implemented for the construction and operation of the Project. The APP will outline measures and protocols that will be undertaken to protect avian species and is intended to protect local and migratory bird species that may occur within the Project area.
	Design
GP-9	Not applicable
GP-10	Not applicable
GP-11	Project features, including helicopter sites, will be placed so as to avoid sensitive features including, but not limited to, riparian areas, water courses, and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower design. This will minimize the amount of sensitive features disturbed and/or reduce visual contrast.
GP-12	Drainage control features will be installed, as appropriate, to minimize the amount of stormwater flow from areas of active construction. Details would be described in the SWPPP.
	Construction Vehicles/Equipment
GP-13	Only clean-burning on-road and off-road diesel engines shall be used. Where feasible, heavy-duty diesel powered construction equipment manufactured after 1996 (with federally-mandated "clean" diesel engines) shall be used.
GP-14	Not applicable
GP-15	Not applicable
GP-16	Not applicable

GP NUMBER	DESCRIPTION
GP-17	All vehicles and equipment operating within 100 feet of an active stream will be inspected daily to ensure they are free of any leaks of fuel, cooling, or lubricating fluids.
GP-18	All construction vehicles shall maintain a hazardous materials spill kit, which shall include absorbent materials, tarps, small storage containers or waterproof bags, and latex gloves. Field personnel shall be made aware of these kits and instructed on how to use them.
GP-19	Refueling, or addition or changing of oil and other fluids for equipment and heavy machinery shall be performed only at approved staging and construction yards. Staging and construction yards will be located on upland sites and spill containment measures will be used to minimize risk of spill or drainage into waterways. Oil and other fluids will be disposed of as required by California law. Emergency refueling, or emergency addition or changing of oil or other fluids shall not be performed within 500 feet of natural stream channels or wetlands.
GP-20	Not applicable
GP-21	LADWP shall contact Angeles National Forest (ANF) dispatch seven days prior to helicopter use and shall provide ANF with radio frequencies being used by the aircraft, aircraft identifiers, the number of helicopters that will be used while working on National Forest System (NFS) lands at any given time, and the flight pattern of helicopters used on NFS lands. If a wildfire occurs in the Project area, upon contact from the Forest Aviation Officer, helicopters in use by LADWP shall immediately cease construction activities and not restart aerial operations until the Forest Aviation Officer provides clearance.
GP-22	The Applicant shall clear brush and dead and decaying vegetation that would pose a fire hazard from the work area prior to starting construction and/or maintenance work. The work area includes areas of construction (e.g., tower sites, switching station site) within the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. Cleared vegetation shall either be removed or chipped and spread onsite in piles no higher than six inches. This will be determined in consultation with individual appropriate land management agencies.
	Access Roads
GP-23	The alignment of any new access roads or overland routes shall follow the designated area's landform contours where possible, providing that such alignment does not additionally impact resource values.
GP-24	To the extent practical, any re-grading of access roads shall be the minimum necessary to provide safe access of construction equipment, and erosion control measures.
GP-25	Not applicable
GP-26	Not applicable
GP-27	Not applicable
GP-28	Not applicable
GP-29	Not applicable
GP-30	Not applicable.
GP-31	Not applicable
GP-32	Not applicable
GP-33	In areas where soils and vegetation are particularly sensitive to disturbance, existing access roads would be repaired only in areas where they are otherwise impassable or unsafe.
	Construction Areas
GP-34	Construction activities shall be limited to the designated right-of-way and approved access and work areas as identified in the ROD and POD. Any deviations from the approved areas must be cleared with the jurisdictional agency and/or landowner.
GP-35	Grading areas shall be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.
GP-36	Not applicable
GP-37	Not applicable
GP-38	Soil excavated from construction activities shall not be left at work areas where the slopes exceed 10 percent or where the work area is within 100 feet of a natural stream or waterbody (receiving water). In these situations, loose soil shall be used elsewhere within the immediate area or stockpiled at the staging area. Stockpiled soil shall be managed as required by the SWPPP. No stockpiling or spreading of soil or other materials shall occur within stream channels.
GP-39	Not applicable
GP-40	Not applicable

GP NUMBER	DESCRIPTION
GP-41	Allow natural vegetation to reoccur on temporarily disturbed areas following the completion of construction.
GP-42	Weed control measures on non-federal lands shall be implemented as determined in consultation with CDFG and the Counties of Los Angeles and Kern Agricultural Commissions.
GP-43	Every effort will be made to minimize vegetation removal and permanent loss at construction sites. Native vegetation will be flagged for protection or stockpiled for recontouring use at the discretion of the Biological Monitor and the Construction Supervisor.
GP-44	In construction areas where recontouring is not required, vegetation will be left in place wherever possible and the original contour will be maintained to avoid excessive root damage and allow for resprouting. Disturbance will be limited to overland driving where feasible to minimize changes in the original contours.
GP-45	Use of heavy equipment within a flowing channel will be avoided if possible; however, should it be necessary, the biological monitor will be notified prior to initiation of construction activities to allow adequate time for site visits and surveys, if necessary.
GP-46	Asphalt or cement equipment will not be rinsed in, nor excess products deposited into any stream or other waterway. Asphalt or concrete effluent will not be allowed to enter into stream or RCA. Effluent will be removed from standing water and prevented from entering a waterway.
GP-47	Fill material, including brush, loose soils, and other similar debris will not be deposited within a stream channel or on a stream bank.
	Surveys/Monitoring
GP-48	Biological Monitor. For areas identified as environmentally sensitive, such as streams, wetlands, riparian areas, and other environmentally sensitive areas, a biological monitor shall be present during ground disturbing construction activities. The biological monitor shall conduct monitoring for any area subject to disturbance from construction activities that may impact biological resources. The biological monitor's duties include minimizing impacts to special-status species, native vegetation, wildlife habitat, and unique resources, as well as to identify potential issues or impacts to biological resources and report those to the authorized biologist where applicable. Authorized biologists are approved by the USFWS for areas where desert tortoise may occur, and generally possess higher qualifications and higher species-specific permissions than biological monitors. Where appropriate, the biological monitor will flag the boundaries of biologically sensitive areas and monitor any construction activities in these areas to ensure that ground disturbance activities and impacts occur within designated limits.
GP-49	Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) will be implemented to educate all construction personnel of the area's environmental conditions and the environmental protection measures that must be adhered to. An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, protection of biological and cultural resources, and proper Best Management Practice (BMP) implementation, to all construction and maintenance personnel.
	Coordination/Permits
GP-50	Prior to construction, LADWP shall consult with all federal, state, and local agencies, including local agency consortiums, having jurisdiction over lands affected by the proposed Project's ROW and ancillary facilities to ensure that no permanent restrictions or preclusions of their land management practices occur.
GP-51	Not applicable
GP-52	Not applicable
GP-53	Not applicable
GP-54	Not applicable
GP-55	Not applicable
GP-56	Not applicable
GP-57	Not applicable
GP-58	Not applicable
GP-59	Not applicable

TABLE 5. MITIGATION MEASURES

BIO-1	*Provide restoration/compensation for impacted sensitive vegetation communities.*
	1a. The intent of this mitigation measure is to require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF) Land Management Plan (LMP). Before construction LADWP shall have a qualified biologist, where concurrence on the biologist has been provided by the USFS and BLM, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees will be documented by identifying the species, number, location, and diameter at breast height (DBH). On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. Tree removal shall not be permitted until replacement trees have been planted or transplanting sites are approved. 1) For NFS and BLM lands, the USFS and BLM shall prepare a Habitat Restoration and Revegetation Plan, in discussion with LADWP, for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-federal lands, LADWP shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for topsoil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bare-root or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program;(j) locations and impacts to all oaks and native trees (over 3 inches DBH); (k) locations of temporary or permanent gates, barricades, law enforcement patrolling, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (NFS and BLM lands only). Restoration efforts will not adversely affect listed species or critical habitat, and measures will be implemented to protect these species during restoration. 2) LADWP shall utilize a USFS/BLM approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All habitats dominated by non-native species before Project disturbance shall be revegetated using appropriate native species. USFS/ BLM approval is required for seeding on NFS/BLM land. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc. will be accepted without the approval of the USFS and BLM on NFS/BLM lands, and seeds must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-Project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring reporting will be yearly from years one to five and every other year from years six to ten or until the success criteria are met. LADWP shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the ANF LMP. If the survival and cover requirements have not been met, LADWP is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned. 3) On NFS land, the USFS/LADWP will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location, and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes, shall not occur until the trees are evaluated by a USFS botanist or authorized arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or adding spoil around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be replaced at the rate appropriate to the DBH. 4) The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks that are to be removed on the ANF shall be as follows: trees from 1 to 5 inches DBH shall be

replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following California Department of Fish and Game (CDFG) guidelines. On the ANF. any oak or native tree that must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated (off-site) at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by an authorized arborist and USFS botanist. On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.

5) Permanent impacts on federal lands shall be determined by the appropriate federal manager (USFS and BLM) at the ratios stated below (Table BIO-MM-1) or at a comparable value. On NFS and BLM lands, impacts will be considered permanent if the trees are not likely to recover by ten years post-disturbance. Where on-site restoration is planned for mitigation of temporary impacts to vegetation communities, LADWP shall identify a Habitat Restoration Specialist, where concurrence has been provided by the USFS, to implement the method of restoration outlined by the USFS/BLM in the Habitat Restoration Plan.

6) On USFS/BLM lands, the creation or restoration of habitat shall be monitored after mitigation site construction to assess progress and identify potential problems with the restoration site. This will be monitored on USFS/BLM lands until the success criteria are met or annually for years one to five, and bi-annually for years six to ten. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken during the ten-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the USFS/BLM (as appropriate). If a fire occurs in a revegetation area within the ten-year monitoring period, LADWP shall be responsible for a one-time replacement. If a second fire occurs, no replanting is required, unless the fire is caused by LADWP activity. Off-site mitigation for NFS/BLM and non-NFS/BLM lands may be required if mitigation rates exceed what can be achieved on NFS/BLM land. This may be in the form of funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts.

1b. During and after construction, USFS/BLM-identified potential or existing entrances to Project-related disturbed areas such as access/spur roads, pull sites, staging areas, fly yards, landing zones, etc. on NFS/BLM lands shall be gated, blockaded and/or concealed in some manner and maintained to prevent the unauthorized use by the general public. Signs prohibiting unauthorized use of these disturbance areas shall be posted on these barricades if deemed necessary by the USFS/BLM. If barricades are being compromised, law enforcement patrolling may also be implemented to control unauthorized access onto Project disturbance areas.

1c. Treat cut tree stumps with Sporax. All stumps of trees (conifers and hardwoods) resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the USFS.

TABLE BIO-MM-1. SUMMARY OF ESTIMATED IMPACTS TO VEGETATION COMMUNITIES ON FEDERAL LANDS

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Alternative 1								
Chamise Chaparral	USFS	16.73	3:1	50.19	56.06	1:1	56.06	106.25
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.30
Riversidian Sage Scrub	USFS	3.06	5:1	15.3	10.48	2:1	20.96	36.26
Southern Coast Live Oak Riparian Forest	USFS	0.05	5:1	0.25	0.38	2:1	0.76	1.01

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Southern Cottonwood Willow Riparian Forest	USFS	0.42	5:1	2.1	0.86	2:1	1.72	3.82
Southern Mixed Chaparral	USFS	14.13	3:1	42.39	45.81	1:1	45.81	88.20
Southern Sycamore Alder Riparian Woodland	USFS	0.13	5:1	0.65	0.25	2:1	0.5	1.15
Southern Willow Scrub	USFS	0.32	3:1	0.96	1.30	2:1	2.6	3.56
Alternative 2								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Disturbed/developed	USFS	7.8	1:1	7.8	24.8	1:1	24.8	32.6
Mojave Creosote Bush Scrub	BLM	2.69	1:1	2.69	21.82	1:1	21.82	24.51
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.06	1:1	2.06	2.31
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.39	2:1	6.78	10.23
Southern Mixed Chaparral	USFS	3.24	3:1	9.72	8.77	1:1	8.77	18.49
Southern Riparian Scrub	USFS	0.33	3:1	0.99	0.66	1:1	0.66	1.65
Southern Sycamore Alder Riparian Woodland	USFS	0.87	5:1	4.35	2.2	2:1	4.4	8.75
Alternative 2a								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Disturbed/developed	USFS	3.24	1:1	3.24	12.72	1:1	12.72	15.96
Interior Live Oak Chaparral	USFS	2.06	5:1	10.3	5.60	2:1	11.2	21.5
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Scrub Oak Chaparral	USFS	1.46	5:1	7.3	3.19	2:1	6.38	13.68
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.40	2:1	6.8	10.25
Southern Mixed Chaparral	USFS	9.03	3:1	27.09	27.88	1:1	27.88	54.97
Southern Riparian Scrub	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland	USFS	0.81	5:1	4.05	1.64	2:1	3.28	7.33
Alternative 3								
Chamise Chaparral	BLM	0.00	1:1	0.0	0.02	1:1	0.02	0.02
Disturbed/developed	USFS	1.04	1:1	1.04	2.13	1:1	2.13	3.17
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	9.57	5:1	47.85	28.19	2:1	56.38	104.23
Scrub Oak Chaparral	USFS	2.87	5:1	14.35	5.83	2:1	11.66	26.01
Southern Riparian Scrub	USFS	0.34	5:1	1.7	0.69	2:1	1.38	3.08
New Circuit								
Chamise Chaparral	USFS	8.03	3:1	24.09	23.05	1:1	23.05	47.14
Riversidian Sage Scrub	BLM	0.04	1:1	0.04	0.34	1:1	0.34	0.38
Riversidian Sage Scrub	USFS	1.98	5:1	9.9	5.96	2:1	11.92	21.82
Southern Coast Live Oak Riparian Forest	USFS	0.08	5:1	0.4	0.66	2:1	1.32	1.72
Southern Cottonwood Willow Riparian Forest	USFS	0.40	5:1	2.0	0.80	2:1	1.6	3.6
Southern Sycamore Alder Riparian Woodland	USFS	0.09	5:1	0.45	0.19	2:1	0.38	0.83
Reconductoring								
Chamise Chaparral (Segment ABG)	USFS	16.07	3:1	48.21	32.65	1:1	32.65	80.86
Disturbed/developed (Segment ABG)	USFS	7.77	1:1	7.77	25.28	1:1	25.28	33.05

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	**Ratio**	**Estimated Off-site Mitigation**	**Estimated Impact**	**Ratio**	**Estimated On-site Restoration**	
Mojave Creosote Bush Scrub (Segment ABG)	BLM	2.85	1:1	2.85	23.16	1:1	23.16	26.01
Mojave Wash Scrub (Segment ABG)	BLM	0.23	1:1	0.23	1.86	1:1	1.86	2.09
Riversidian Sage Scrub (Segment ABG)	USFS	5.07	5:1	25.35	10.30	2:1	20.6	45.95
Southern Coast Live Oak Riparian Forest (Segment ABG)	USFS	3.25	5:1	16.25	6.60	2:1	13.2	29.45
Southern Mixed Chaparral (Segment ABG)	USFS	2.86	3:1	8.58	8.01	1:1	8.01	16.59
Southern Riparian Scrub (Segment ABG)	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland (Segment ABG)	USFS	0.95	5:1	4.75	2.34	2:1	4.68	9.43
Southern Coast Live Oak Riparian Forest (Segment K)	BLM	0.02	1:1	0.02	0.04	1:1	0.04	0.06
Southern Mixed Chaparral (Segment K)	BLM	0.00	1:1	0.0	0.01	1:1	0.01	0.01

Note: The permanent and temporary impact calculations provided above are estimates based on the impact model described in Appendix C of the Biological Resources Technical Report. Therefore, acreage numbers for the habitat types listed above may be smaller than those listed in the table. Preconstruction surveys will be conducted to estimate the acreage impacts and will be based on the final design not the impact model.

BIO-2 *The following prescriptions would prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.*

2a Prepare and implement a Weed Control Plan. LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. The long-term Weed Control Plan, including monitoring and eradication, will be defined as part of the 50 year Operations and Maintenance Permit. On the ROW easement lands administered by the USFS/BLM, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations. The Weed Control Plan shall be submitted to the USFS/BLM for final authorization of weed control methods, practices, and timing before implementation of the Weed Control Plan on public lands. Weed control on BLM lands using pesticides will require an approved BLM Pesticide Use Permit. Pesticide Use Permits are issued for a maximum of three years. ROW easements located on private lands shall include adaptive provisions such as wheel and equipment washing for the implementation of the Weed Control Plan. The Weed Control Plan shall include the following:

1) A pre-construction weed inventory shall be conducted on NFS and BLM lands by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006); (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the USFS and/or BLM as species of priority (for NFS/BLM lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated before construction according to control methods and practices for invasive weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated and utilized for eradication and monitoring post-construction.
2) Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all State and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator, if the herbicide is in the restricted use category. The most effective herbicides with the least toxic surfactant available shall be used. Herbicides shall not be applied during or within 24 hours of a

70% chance of occurring rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used. Herbicides shall not be applied by spray equipment when wind velocities exceed 6 mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied at over 15 mph. In areas containing special-status plants or animals, there will be a 5- to 70-foot buffer where herbicides are not used. The size of the buffer will be determined and flagged for avoidance by an authorized botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of species, vulnerability of herbicide being used, concentration of herbicide used based on no observed effect concentrations and/or environmental conditions and terrain. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds. Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by an agency botanist.

For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows.

3) On the ANF and BLM lands, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten, or until success criteria are met. Treatment of all identified weed populations shall occur at an appropriate interval so as to meet the success criteria. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that impact site.

4) During Project preconstruction and construction, all seeds and straw materials shall be weed-free rice straw, and all gravel and fill material shall be certified weed-free by the county Agriculture Commissioners' Offices. Any deviation from this must be approved by a USFS/BLM botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the USFS/BLM.

5) Before beginning preconstruction activities, the USFS, in coordination with LADWP, will determine suitable locations to install field washing stations as part of the Weed Control Plan. Before commencing construction activities, LADWP shall document that all vehicles, equipment, and tools used on the Project have been cleaned at existing construction yards or legally operating car washes. This is a one-time requirement designed to address the potential of new species of weeds being transported from outside the area. If, however, vehicles, equipment, or tools are used or driven off paved roads on non-NFS lands, washing must occur before entering USFS lands.

During Project preconstruction and construction, all vehicles, equipment, or tools which will be used outside of permitted Project roadways shall be washed at the nearest station before operating off-road. In other areas also designated by the USFS, vehicles, equipment, and tools will be washed at the nearest station after exiting those areas. Vehicles that do not leave permitted Project roadways are not required to be washed after the initial washing described above. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the USFS.

Written daily logs shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the USFS for inspection at any time and shall be submitted to the USFS permit administrator on a monthly basis.

6) During Project operation and maintenance activities, weeds shall be cleared and disposed of in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a USFS/BLM-approved method.

2b **Remove weed seed sources from construction access routes.** Before construction, LADWP shall initiate invasive species eradication. Populations to be treated will be small to moderate and isolated, but have the potential to spread aggressively during construction. Post-construction, these isolated populations will be included and treated according to the restoration plan. Per the Forest Service Manual (FSM) 2080 Best Management Practice (BMP) guideline, LADWP shall also remove or reduce sources of weed seed along the travel routes associated with Project construction. Weed species identified along the Alternatives and

	associated access roads include tocalote, artichoke thistle, tree tobacco, saltcedar, slender wild oat/wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, blessed thistle, filaree, shortpod mustard, prickly lettuce, common horehound, yellow sweetclover, rabbit foot grass, Mediterranean grass, sowthistle, rat-tail fescue, tree-of-heaven, giant reed grass, yellow starthistle, bull thistle, fennel, perennial pepperweed, and black locust. To prevent the introduction or control the spread of noxious weeds, hand removal or other control methods will be implemented to reduce seed production during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, LADWP shall identify, using an authorized plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF and BLM lands. Target infestations identified by Project surveys should be controlled before construction. LADWP shall initiate eradication of the target infestations discovered during pre-construction surveys along construction routes. **2c** **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Before construction and during each year of use for construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF and BLM lands, weed-infested areas should be hand-weeded and/or treated as appropriate for the individual weed species under the guidance of an authorized plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the USFS/BLM. Unless otherwise authorized by the USFS/BLM, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, bromes and other noxious weed seed production, by hand-removing or weed-whacking infestations when flowering has just started, but before seeds have been produced. All plant debris shall be disposed of at a USFS/BLM approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by an authorized plant ecologist or restoration ecologist in coordination with LADWP and USFS/BLM botanist or weed specialist. **2d** **Use of Herbicides to Control Exotic Weeds.** LADWP may use herbicides where deemed necessary for the control of exotic weeds within the Project area. Weed control should be species-specific, and herbicides should be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for that weed species. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. Any herbicide use on NFS lands, BLM lands, and private lands would be subject to the review and approval of the appropriate personnel and in coordination with LADWP.
BIO-3	*Incorporate riparian area avoidance and permit measures.* The following actions and all permit conditions detailed within the Nationwide 12 permit, CDFG 1602 Streambed Alteration Agreement, and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). **3a** LADWP shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in RCAs without the authorization of the USFS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1 to August 15) unless otherwise approved by the USFS. LADWP shall prepare and implement a USFS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal or tree trimming), monitoring requirements, and restoration requirements. This Plan shall be submitted to the USFS for approval before construction or the grading of any access road. **3b** Before construction, authorized biologist shall stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones will include a 10-foot buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities shall be restricted from these zones, although essential vehicle operation and foot travel will be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited within the exclusion zone. **3c** In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector and USFS, shall narrow the width of the road through the area to the minimum extent required for safe travel. New spur roads and existing access road improvements shall be

	constructed and implemented using methodology that preserves existing hydrology. **3d** Towers shall not be constructed in riparian areas. **3e** All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities shall be restored according to the guidelines of the Habitat Restoration Plan to the extent required to ensure no net loss of habitat functions and values. Following construction activities, the areas will be restored as soon as practicable. **3f** Permanent, unavoidable losses of riparian areas will be mitigated by restoration and/or preservation of off-site habitats, as outlined in the Habitat Restoration Plan. The final mitigation and off-site restoration locations will be determined in consultation with LADWP and the responsible agency(s). Mitigation acreage ratios will be consistent with those listed in Table BIO-MM-1.
BIO-4	*Provide restoration/compensation for affected jurisdictional areas.* **4a** Impacts to areas under jurisdiction of the USACE, RWQCB, USFS and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible, including emergency repairs, and access/spur roads within RCAs, the applicant shall provide the necessary mitigation required as part of wetland permitting. This will include creation, restoration, and/or preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation will be determined in consultation with LADWP and the responsible agency(s) as part of the wetland permitting process. **4b** Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas.
BIO-5	*Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.* **5a.** Conduct preconstruction surveys in locations where potential habitat exists for special-status species. If sign or habitat is detected during the surveys, construction activities will be monitored by authorized biologists, or exclusion fencing will be placed around work areas. If federally listed individuals are found within the area of potential effect, the authorized biologist shall notify the construction manager and USFWS. The construction manager, in consultation with the USFWS and the authorized biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. If non-federal special-status species are found within the area of potential effect, USFS, BLM and CDFG will be notified and, in consultation with these agencies, the species will be relocated to areas that are not potentially impacted by the Project. This only applies to species that are not listed under the California Endangered Species Act (CESA) unless authorized by an Incidental Take Permit (ITP) or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR). **5b.** Cover all steep-walled trenches or excavations used during construction to prevent entrapment of wildlife (e.g., reptiles and small mammals). If the trenches or excavations cannot be covered, a ramp that will sufficiently allow wildlife to escape shall be placed into the trench or excavated area, or exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife, shall be inspected by the authorized biologists a minimum of three times per day and immediately before backfilling. Furthermore, employees and contractors shall look under vehicles and equipment for the presence of wildlife before moving the vehicle or equipment. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the authorized biologist. Should a dead or injured special-status species be found in a trench or excavation or anywhere in the construction zone or along an access road, the authorized biologist shall contact BLM and/or USFS (for activities on land managed by the agencies) and the Wildlife Agencies within 48 hours of the finding. The authorized biologist shall report the species found, the location of the finding, and the cause of death (if known), and shall submit a photograph and any other pertinent information.
BIO-6	*Implement a Worker Environmental Awareness Program.* An authorized biologist(s) shall conduct a detailed biological Worker Environmental Awareness Program (WEAP) for all Project personnel before any construction or activities within the Project footprint. The WEAP shall include discussions of Project permits and brief summaries of their conditions; discussions of agency involvement, their applicable sensitivity measures, and relevant environmental protection legislation (e.g., the Endangered Species Act, the Migratory Bird Treaty Act); descriptions of special-status species and other sensitive resources that could exist in the Project area, along with their locations, legal status and protections; and a review of all measures to be implemented for avoidance of these sensitive resources. The final list of wildlife species to be included in the WEAP may be reduced at the discretion of the authorized biologist with concurrence from applicable agencies. **6a.** Training materials and briefings shall also include the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS and BLM lands and identification of USFS and BLM

	sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. Discussion of GPs and BMPs shall include topics such as appropriate work limits, avoiding the spread of non-native plant species, fire safety, wildlife avoidance, trash and debris collection, spill prevention and containment protocol, and appropriate protocol for passage and/or construction near riparian zones. Sightings of sensitive wildlife species or harmful encounters with any wildlife species shall be reported to the authorized biologist immediately for evaluation and, as necessary, reporting to agencies. **6b.** Training materials and a course outline shall be provided to the USFS/BLM for review and approval at least 30 days before the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (e.g., limited operating periods) will be provided to the environmental monitors and construction crews before ground disturbance. **6c.** The training shall be conducted for all crew members present for the start of construction. If new crew members are brought to the Project after this time, they shall take part in the WEAP before beginning construction work; if the authorized biologist is not available at this time, new crew members shall be given a summary handout of the WEAP until the full WEAP can be administered by the authorized biologist, to be conducted no more than one workweek following the crew members' assignment to the Project. All crew members who have completed the WEAP shall submit their names to a list to be updated continuously and furnished to agencies upon request. No construction worker may work in the field for more than five days without participating in the WEAP.
BIO-9	*No mitigation measures required for Impact BIO-9.*
BIO-10	*No mitigation measures required for Impact BIO-10.*
BIO-11	*Reduce avian electrocutions/collisions on transmission lines.* Raptor safety protection will be required on tower/conductor (lines) in appropriate locations. The Project would have minimum clearance between phase conductors or between phase conductors and grounded hardware, as recommended by the Avian Power Line Interactive Committee (APLIC 2006), that are sufficient to protect even the largest birds, such as California condor, and therefore would present little to no risk of bird electrocution. New Project structures shall be designed to implement collision-reducing techniques as described in the latest version of the APLIC guidelines. Devices such as swan wrapping or other similar functioning devices may be required if areas are identified as being a hazard to birds. In addition, per General Practice (GP) 8, an Avian Protection Plan will be developed for this Project that will include avian collision protocols.
BIO-12	*No mitigation measures required for Impact BIO-12.*
BIO-13	*Protect special-status plant species and their habitat.* **13a.** Conduct preconstruction surveys for State and federal Threatened, Endangered, Proposed, Petitioned, Candidate, USFS Sensitive, USFS Watch, BLM Sensitive, and California Native Plant Society (CNPS) listed plants and avoid any occurrences of these plants. LADWP shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in a 250-foot radius around all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by an authorized plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS. The résumé of the proposed biologists will be provided to the USFS and BLM for concurrence before ground disturbance. The completion of these surveys shall be coordinated with the federal land manager. All listed plant species found shall be marked and avoided. **13b.** Before site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance, including human trampling, erosion, and dust. The size of the buffer will depend upon the proposed use of the immediately adjacent lands, and include consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the loss of the species, with the

	approval of the USFWS, CDFG, USFS, and BLM and in coordination with LADWP. If impacts to listed plants are determined to be unavoidable, USFWS will be contacted immediately and additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS before impacts are authorized, whichever is appropriate. **13c.** Impacts to non-listed plant species (i.e., USFS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other USFS or BLM approved methods. For USFS lands, if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of USFS Sensitive plant species, and reseeding/transplanting are not feasible options, LADWP shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).This ratio will apply only to specific acreage inhabited by special-status plant species that are removed during construction, and will supersede ratios listed in Table BIO-MM-1 regardless of habitat type. The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist. **13d.** For USFS species, special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the federal land manager (USFS and BLM) until the success criteria outlined in the Habitat Restoration Plan are met. Where reseeding has occurred, LADWP shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the federal land manager (USFS and BLM).
BIO-14	*Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat.* **14a.** All Project activities taking place within suitable habitat for the western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo shall be conducted from November through early March, which is a period outside their breeding seasons (Sedgwick 2000, Sogge 2000, Brown 1993, Kus 2002, Hughes 1999). If these activities cannot be avoided during the breeding season, the following measures shall apply: **14b.** If construction activities must occur during the breeding season in areas that have the potential to support listed riparian species, an authorized ornithologist shall conduct protocol surveys of the Project and adjacent areas within 500 feet to determine if this species is present within the area and to determine breeding status. USFWS protocol surveys will be conducted for southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (if no protocols exist, the appropriate land management agency will establish the protocols to be used). In known occupied habitat for listed riparian birds, LADWP shall only conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season. If breeding is confirmed, the USFWS-recommended buffers will be applied and no activities will occur within that buffer. **14c.** Protocol or focused surveys, as appropriate, should be conducted within one year of start of construction. However, on NFS lands, annual surveys in suitable habitat may be required during construction. These surveys may be modified through the coordination with the USFWS, CDFG, USFS, LADWP and the BLM based on the condition of habitat, the observation of the species, or avoidance of riparian areas during the breeding season. **14d.** If a territory or nest is confirmed, the USFWS and CDFG shall be notified immediately. On NFS or BLM lands, these agencies would be notified immediately. In coordination with the USFWS, CDFG and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 40 dB(A) hourly Leq at the edge of the nest site as determined by an authorized biologist in coordination with a qualified acoustician (Haas 2007). If the noise meets or exceeds the 40 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the authorized biologist and USFS, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective

	noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 40 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No construction or vehicle traffic shall occur within this buffer during the breeding season for these species. **14e.** The nest must be monitored by an authorized biologist during the construction activities. If the monitor determines that Project activities are disturbing or disrupting nesting activities, the monitor shall notify the construction manager, and the construction manager, in consultation with the biological monitor, has the authority to implement measures to reduce the noise and/or disturbance in the vicinity. **14f.** Because these species are State-listed as endangered by CESA, LADWP would apply for an ITP if take of any of these species is anticipated during Project construction.
BIO-15	*Protect coastal California gnatcatcher and its habitat.* **15a.** All Project activities taking place within suitable habitat for the coastal California gnatcatcher shall be conducted from September through February, which is outside their breeding season. If these activities cannot be avoided during the breeding season, the following measures shall apply: **15b.** LADWP shall conduct protocol surveys for coastal California gnatcatchers in areas supporting coastal sage scrub habitat that may be affected by the Project. In known occupied habitat for the California gnatcatcher, LADWP shall only conduct focused surveys for coastal California gnatcatchers. Survey areas shall include a 500-foot buffer around Project disturbance areas. **15c.** If a territory or nest is confirmed, the USFWS shall be notified immediately; on NFS or BLM lands, these agencies would also be notified immediately. In coordination with the USFWS and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A)hourly Leq at the edge of the nest site as determined by an authorized biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No Project activities may occur in these areas unless otherwise authorized by USFWS. LADWP shall obtain incidental take authorization from the USFWS before further activities. **15d.** Protocol or focused surveys, as appropriate, shall be conducted, at a minimum, within one year of start of construction. These surveys may be modified through the coordination with the USFS, BLM, and CDFG based on the condition of habitat, the observation of the species, or avoidance of nesting areas during the breeding season. ***15e.*** Construction activities in occupied gnatcatcher habitat will be monitored by a full-time authorized biologist. The monitoring shall be of a sufficient intensity to ensure that the authorized biologist could detect the presence of a bird in the construction area. At a minimum, one full-time monitor shall be present for every two miles of active construction within occupied habitat. The monitors shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, will have the authority to halt all activities until appropriate corrective measures have been completed.
BIO-16	*This measure protects burrowing owls and is not included in this document since it is not a federally listed species.*
BIO-17	*This measure protects bald and golden eagles and is not included in this document since it is not a federally listed species.*
BIO-18	*Protect California condor.* **18a.** For all Project activities taking place immediately adjacent to or within known condor-occupied areas, an authorized biologist will monitor all construction activities and assist LADWP in the implementation of the monitoring program. The résumé of the proposed biologist(s) will be provided to the BLM and USFS for approval. This biologist(s) will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within known condor-occupied areas. The authorized biologist shall notify the construction manager, and the construction manager, in consultation

	with the authorized biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area. The authorized biologist will have radio contact with the Project foreman, who will be in radio contact with the helicopter pilot. The authorized biologist will provide information to LADWP to avoid conflicts with condors. All condor sightings in the Project area will be reported to the USFWS, BLM (on private lands), and USFS (on NFS lands). LADWP will coordinate with USFWS on the construction schedule and helicopter work areas to determine if any condors have been tracked or observed in the vicinity of the Project area. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area and the USFWS will be notified immediately. Should condors be found roosting within 0.5 mile of the construction area, no construction activity shall occur between one hour before sunset to one hour after sunrise, or until the condors leave the area. Should condors be found nesting within 1.5 miles of the construction area, all construction activity will cease and the USFWS will be notified immediately. **18b.** **Microtrash**. All trash is required to be disposed of as written in the Proper Disposal of Construction Waste Plan for the Project. Additional language has been added to this Plan to address the disposal of microtrash. Workers will be trained on the issue of microtrash – what it is, its potential effects to California condors, and how to avoid the deposition of microtrash. In addition, all workers will properly dispose of their trash throughout the day and daily sweeps of the work area will occur to collect and remove trash in locations with the potential for California condors to occur. **18c.** **California Condor Worker Education Program**. LADWP will develop a flyer that will be distributed to all workers on the Project concerning information on the California condor. Information to be included consists of the following: species description with photos and/or drawings indicating how to identify the California condor and how to distinguish condors from turkey vultures and golden eagles; protective status and penalties for violation of the Endangered Species Act; avoidance measures being implemented on the Project; and contact information for communicating condor sightings. ***18d.*** **Reporting**. All California condor sightings in the Project area will be reported directly to the USFWS, USFS, and BLM (as appropriate). Before commencement of helicopter activity, LADWP will coordinate with a USFWS condor biologist to determine if any condors have been tracked or observed in the vicinity of the Project area.
BIO-19	*This measure protects California spotted owls and is not included in this document given that it is not a federally listed species.*
BIO-20	*This measure protects American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox and is not included in this document since these species are not federally listed.*
BIO-21	*This measure protects sensitive bat species and is not included in this document since these species are not federally listed.*
BIO-22	*Protect special-status reptile species.* An authorized biologist with demonstrated expertise with special-status herpetofauna shall monitor all construction activities and assist LADWP in the implementation of the monitoring efforts. The résumé of the proposed biologist will be provided to the USFS or BLM (as appropriate) for concurrence before the onset of ground-disturbing activities. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of the special-status herpetofauna. Any special-status herpetofauna found within a Project impact area shall be salvaged by the authorized biologist and relocated to suitable habitat outside the impact area. If the installation of exclusion fencing is deemed necessary by the authorized biologist, the authorized biologist will direct the installation of the fence. Exclusion fencing will only be used for special-status herpetofauna that are not protected by CESA, unless specifically authorized by an ITP, or are not considered Fully Protected Species under Fish and Game Code or Title 14 of the CCR. Clearance surveys for special-status herpetofauna shall be conducted by the authorized biologist before the initiation of construction each day.
BIO-23	*Protect desert tortoise and prevent habitat loss.* **23a.** Preconstruction clearance surveys will be conducted by authorized biologists for desert tortoise within suitable habitat. Preconstruction surveys will be conducted within 24 hours prior to construction activities. Surveys will be conducted by an authorized biologist and will provide 100 percent coverage of all areas to be disturbed during construction. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises will be examined to assess occupancy of each burrow by desert tortoises and processed in accordance with current USFWS guidelines (USFWS 2009d). If tortoise sign is found, construction activities will be monitored by a biologist authorized by the USFWS. If no tortoise sign is found, monitoring by an authorized tortoise biologist would not be required. Instead, an authorized biologist

		could be on call should a tortoise wander into non-monitored sites.
	23b.	Vehicular traffic during construction will be confined to existing routes of travel to and from the project site, and cross-country vehicle and equipment use outside designated work areas will be prohibited. Where new access is required outside of existing roads (e.g., new spur roads) or the construction zone, the route will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.
	23c.	Burrows within the construction zone shall be flagged by the authorized biologist so that the authorized biologist would be able to more easily locate them during construction. The authorized biologist shall be on-site to monitor all construction that occurs in the vicinity of flagged burrows and to watch for desert tortoise. All desert tortoise burrows or pallets in the construction area shall be excavated by the USFWS-authorized biologist. The construction area includes the expansion area of the Barren Ridge Switching Station (235 feet) and 500 feet total or 250 feet on either side of the new 230 kV transmission line. The 250 feet on either side of the transmission line account for the access roads, spur roads, tower assembly and installation. The staging sites and concrete batch plants will not be placed within the desert tortoise habitat.
	23d.	Desert tortoises that are found above ground during construction and need to be moved from potential harm shall be placed in the shade of a shrub by the USFWS-authorized biologist. Any desert tortoise removed from burrows shall be placed in an unoccupied burrow of approximately the same size as the one from which it was removed. Tortoises shall not be placed more than 1,000 feet from where they were found. If an existing burrow is unavailable, the authorized biologist shall construct a burrow of similar size, shape, depth, and orientation as the original burrow. Desert tortoises moved during inactive periods would be monitored for at least two days after placement in the new burrows to ensure their safety. The authorized biologist shall be allowed some judgment and discretion to ensure that the survival of the desert tortoise is likely.
	23e.	If a tortoise is in a construction or maintenance area and is not moving, adjacent activities would be halted until the authorized biologist is able to move it out of harm's way. Moving desert tortoises "from harm's way" refers to moving the desert tortoise the minimum distance necessary to place it in a safe location within its home range.
	23f.	Any time a vehicle is parked, the ground around and under the vehicle shall be inspected for desert tortoises before the vehicle is moved. If a desert tortoise is observed, it shall be left to move on its own. If this does not occur within 15 minutes, the authorized biologist shall remove and relocate the tortoise out of harm's way, no more than 500 meters from its original location. Moving desert tortoise from harm's way will only occur on the transmission line portions of the project. All other movements involve translocation of desert tortoises; these movements will only occur with desert tortoises found within the Barren Ridge Switching Station expansion site. Authorized biologists will follow current USFWS desert tortoise handling guidelines at all times.
	23g.	Within potential desert tortoise habitat areas, vehicles shall not exceed 20 miles per hour on access roads during the period of highest desert tortoise activity (March 1 through October 31).
	23h.	Tower foundations or other excavations that pose a potential to entrap or injure tortoise shall be inspected three times daily until the foundation or other structure is in place. Excavations also will include an escape ramp.
	23i.	A desert tortoise education program will be presented by an authorized biologist to all personnel who will be onsite at any time, including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. This program will be presented in English and Spanish, if appropriate, and contain information concerning the biology and distribution of the desert tortoise as it is relevant to the proposed action, its legal status and occurrence in the proposed Project area, the definition of "take" and associated penalties, the terms and conditions of this biological opinion, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when tortoises are encountered or in cases of non-compliance with the Biological Opinion. The name of each individual trained will be recorded on a sign-in sheet.
	23j.	A litter-control program will be implemented to reduce the attractiveness of the area to opportunistic predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed of properly in predator-proof containers with re-sealing lids. Trash containers will be emptied, and construction waste will be removed daily from the Project area and disposed of in an approved landfill.
	23k.	LADWP shall report any observations of raven predation on desert tortoises in the Project area to CDFG and USFWS. In construction areas that are heavily used and in potentially occupied desert tortoise habitat, work and staging areas, including the locations of the transmission line under construction, may be fenced with approved temporary desert tortoise exclusion fencing in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. An authorized biologist will

	assist in determining the boundaries of the area to be fenced in consultation with the USFWS, the CDFG, and the BLM when construction areas are within lands administered by the BLM. All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed or conducted by an authorized biologist. The fencing will remain in place for the duration of construction activities at a particular location and will be removed when construction activities are complete. 1) Temporary fencing should consist of 1-inch mesh or 1-inch horizontal by 2-inch vertical mesh (hardware, cloth or plastic) and be installed flush with the ground and extend at least 18 inches above-ground. Temporary tortoise-proof fencing should not be buried. In areas of high rodent activity where plastic mesh is used, temporary fencing may need more frequent monitoring to ensure no breaches exist. A desert tortoise authorized biologist will inspect the fencing on a biweekly basis to ensure that no holes develop that could allow desert tortoises to enter the work areas. If holes are found, they will be repaired immediately. 2) If a desert tortoise is found within an area that has been fenced to exclude them, activities will cease until an authorized biologist moves it out of harm's way outside of the fence, no greater than 500 meters away from its original location. At this time, the fencing will be inspected for holes. **23l.** No pets or firearms will be permitted in the work area.
BIO-24	*Protect arroyo toad and California red-legged frog.* **24a.** **LADWP shall conduct USFWS-approved protocol surveys for arroyo toads and California red-legged frogs at all locations containing suitable habitat near the proposed construction sites** within two years before the start of construction. **24b.** If arroyo toads are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no arroyo toads are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) LADWP shall retain a authorized biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and assist LADWP in the implementation of the monitoring program. The résumés of the proposed biologists will be provided to the USFS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad. 2) All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFS and the authorized biologist. LADWP shall provide information on the general location of construction activities within habitat of the arroyo toad and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, LADWP, USFS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on arroyo toads. 3) Biological monitors will inspect and monitor construction impact areas daily for species of special concern. If arroyo toads are located, work will not commence until the species has left on its own and USFWS has been contacted. 4) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 5) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 6) LADWP will avoid ground disturbing activities (e.g., grading, stream crossing upgrades, parking) along access roads within a 1.0 mi (1.6 km) buffer of occupied stream habitat for arroyo toads during the activity period for arroyo toads (March through November). This date and buffer may be modified based on the existing temperature regime and habitat conditions, with Angeles National Forest approval.

7) LADWP will limit use of the access roads in areas known to support arroyo toad within a 1.0-mile (1.6 km) buffer to daylight hours only during the activity period for arroyo toads (generally March through November). Use of these roadways during rain events will not occur during the activity period for arroyo toads. Vehicle speeds will be limited to 15 mph (24 kph), and no parking or loitering will occur along the access roads. An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code.

8) No stockpiles of materials will occur in areas occupied by arroyo toads.

9) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain arroyo toads will be reported to the USFS and USFWS within one hour.

10) The ANF will require each ac/ha of arroyo toad occupied habitat that is permanently impacted on the Angeles National Forest, five ac/ha of arroyo toad occupied habitat will be conserved in the vicinity of the impacted habitat.

24c. If California red-legged frogs are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no California red-legged frogs are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS.

1) All trash that may attract predators of red-legged frogs will be removed from work sites or completely secured at the end of each work day.

2) Between November 1 and March 31, no work will be authorized within one mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. The one-mile buffer distance may be reduced based on the topography of the site, with the approval of the USFWS and the USFS.

3) Between April 1 and October 31, no work will be authorized within 0.5 mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized.

4) LADWP shall provide information on the general location of construction activities within habitat of the red-legged frog and the actions taken to reduce impacts to this species. Because red-legged frogs may occur in various locations during different seasons of the year, LADWP, USFS, and authorized biologists will work with USFWS to determine the season when specific construction activities would have the least adverse effect on red-legged frogs.

5) Construction activities that may occur near breeding pools or other areas where large numbers of red-legged frogs may congregate will be conducted during times of the year when individuals have dispersed from these areas (i.e., winter) or the species is dormant, unless otherwise authorized by the USFS and USFWS. The authorized biologist will assist LADWP in scheduling its work activities accordingly.

Biological monitors will inspect and monitor construction impact areas daily for species of special concern. If California red-legged frogs are located, work will not commence until the species has left on its own and USFWS has been contacted.

6) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, will have the authority to halt all activities until appropriate corrective measures have been completed.

7) LADWP shall avoid nighttime activities when red-legged frogs may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area.

8) A authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible, and ensure that activities are in compliance with the California Fish and Game Code.

9) No stockpiles of materials will occur in areas occupied by California red-legged frogs.

10) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.

11) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain California red-legged frogs will be reported to the USFS and the USFWS within one hour.

5.0 ENVIRONMENTAL SETTING

The physiography of the Project area in the Kern to Los Angeles County regions includes the flat Antelope Valley gradually rising in elevation (Northern region) and giving way to the foothills of the ANF (Central region). Continuing south, the foothills gradually give way to the City of Santa Clarita (Southern region). Drainages originating from the foothills of the ANF have carried rock detritus and water to the Santa Clarita area. This process has produced several riparian areas, which support a rich, varied, and unique ecosystem. The diversity and distribution of biological resources within the action area corridor are a function of the regional climate, soils, and topography. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species. Table 6 lists these habitat types including acres and percentage of total acreage within the proposed Project (refer to Appendices A, B, and C for Project component maps of the vegetation communities).

For conventional ground construction of the lattice towers, the temporary disturbance column in Table 6 takes into account structure staging area, and sites for pulling and tensioning, sleeving and stringing, guard structures, material staging, and concrete batch plants. The permanent disturbance would take into account the structures, spur and access roads. Within the ANF where the terrain is steep and access is limited, the USFS would require that the new double-circuit 230 kV structures be constructed by the use of helicopter. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. For the new 230 kV line (Proposed Action), helicopter construction is currently identified as not being needed since existing access is within 300 feet of the proposed centerline. During the design phase there may be situations that require helicopter construction; refer to Table 3 for details on the estimated helicopter disturbance. Helicopter disturbance was considered during this analysis, as indicated in the species discussion. Specific locations of the helicopter disturbance will be finalized during the design phase. However, the assumption is that conventional construction would be used and that is what is analyzed below in Table 6 for the new 230 kV line (Proposed Action). Final determinations on helicopter construction areas would generally be made where tower sites have no existing access roads within 300 feet and slopes are greater than 25 percent. Final identification of these tower sites would be determined and agreed upon by USFS, BLM and LADWP.

TABLE 6. VEGETATION TYPES OCCURRING ALONG THE NEW 230 KV LINE, RECONDUCTORING AND THE NEW 230 KV CIRCUIT.

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
New 230 kV Transmission Line (Proposed Action)							
Agricultural Land	Private	735.34	78.94	78.94	10.25	11.15	1.5%
California Annual Grassland	Private	227.37	24.40	24.40	3.85	5.26	2.3%
Chamise Chaparral	USFS	344.45	38.61	39.38	6.9	10.11	2.9%
Disturbed/developed	Private	97.83	10.49	10.49	1.74	2.49	2.5%
Disturbed/developed	USFS	231.75	24.86	24.86	4.84	7.80	3.4%
Joshua Tree Woodland	Private	320.32	34.35	34.35	4.23	4.23	1.3%
Mojave Creosote Bush Scrub	BLM	203.40	21.82	21.82	2.69	2.69	1.3%
Mojave Creosote Bush Scrub	Private	1185.16	127.78	127.78	15.73	15.73	1.3%
Mojave Wash Scrub	BLM	19.16	2.06	2.06	0.25	0.25	1.3%

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Mojave Wash Scrub	Private	58.34	6.26	6.26	0.77	0.77	1.3%
Riversidian Sage Scrub	Private	5.09	0.56	0.56	0.15	0.28	5.5%
Riversidian Sage Scrub	USFS	82.47	8.85	8.85	1.37	1.84	2.2%
Sandy Area other than Beach	Private	3.28	0.35	0.35	0.04	0.04	1.2%
Southern Coast Live Oak Riparian Forest	USFS	20.33	3.01	3.40	0.56	0.69	3.4%
Scrub Oak	USFS						
Southern Mixed Chaparral	Private	39.37	4.22	4.22	1.03	1.87	4.7%
Southern Mixed Chaparral	USFS	81.79	8.77	8.77	1.89	3.24	4.0%
Southern Riparian Scrub	USFS	6.19	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	Private	1.44	0.16	0.16	0.02	0.02	1.4%
Southern Sycamore Alder Riparian Woodland	USFS	20.32	2.18	2.18	0.50	0.50	2.5%
Reconductoring – Segments ABG*							
Agricultural Land	Private	736.94	79.04	79.04	10.41	11.53	1.5%
California Annual Grassland	Private	226.28	24.27	24.27	3.78	5.10	2.2%
Chamise Chaparral	USFS	304.26	32.65	32.65	8.54	16.07	5.3%
Disturbed/developed	Private	97.83	10.49	10.49	1.86	2.81	2.9%
Disturbed/developed	USFS	235.69	25.28	25.28	4.86	7.77	3.3%
Joshua Tree Woodland	Private	319.89	34.31	34.31	4.22	4.22	1.3%
Mojave Creosote Bush Scrub	BLM	215.91	23.16	23.16	2.85	2.85	1.3%
Mojave Creosote Bush Scrub	Private	1166.83	124.90	124.90	15.37	15.37	1.3%
Mojave Wash Scrub	BLM	17.35	1.86	1.86	0.23	0.23	1.3%
Mojave Wash Scrub	Private	60.00	6.43	6.43	0.79	0.79	1.3%
Riversidian Sage Scrub	Private	6.53	1.19	1.19	0.31	0.59	9.0%
Riversidian Sage Scrub	USFS	85.68	10.30	10.30	2.69	5.07	5.9%
Sandy Area Other than Beach	Private	2.30	0.25	0.25	0.03	0.03	1.3%
Southern Coast Live Oak Riparian Forest	USFS	61.53	6.60	6.60	1.73	3.25	5.3%
Southern Mixed Chaparral	Private	39.56	4.24	4.24	1.03	1.88	4.7%
Southern Mixed Chaparral	USFS	74.74	8.01	8.01	1.69	2.87	3.8%
Southern Riparian Scrub	USFS	6.17	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	Private	3.12	0.53	0.53	0.12	0.21	6.7%
Southern Sycamore Alder Riparian Woodland	USFS	19.61	2.34	2.34	0.54	0.95	4.8%
Reconductoring –Segment K *							
Chamise Chaparral	Private	73.31	7.86	7.86	1.85	3.32	4.5%
Disturbed/developed	Private	400.77	43.18	43.18	6.11	7.45	1.9%
Riversidian Sage Scrub	Private	129.39	13.88	13.88	3.09	5.40	4.2%
Sandy Area Other than Beaches	Private	12.07	1.29	1.29	0.20	0.28	2.3%
Southern Coast Live Oak Riparian Forest	BLM	0.34	0.04	0.04	0.01	0.02	5.9%
Southern Coast Live Oak Riparian Forest	Private	22.20	2.38	2.38	0.63	1.17	5.3%
Southern Mixed Chaparral	BLM	0.40	0.04	0.04	0.01	0.02	5.0%
Southern Mixed Chaparral	Private	253.02	27.14	27.14	6.32	11.3	4.4%
Southern Riparian Scrub	Private	48.38	5.19	5.19	1.13	1.95	4.0%
Southern Sycamore Alder Riparian Woodland	Private	6.06	0.65	0.65	0.17	0.32	5.3%

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Southern Willow Scrub	Private	9.10	0.98	0.98	0.12	0.12	1.3%
New 230 kV Circuit*							
Chamise Chaparral	State of California	134.42	21.50	23.83	4.61	7.60	5.7%
Chamise Chaparral	Private	68.63	9.28	10.05	1.73	2.27	3.3%
Chamise Chaparral	USFS	139.37	21.06	23.05	4.73	8.03	5.8%
Disturbed/developed	State of California	11.04	1.18	1.18	0.31	0.58	5.2%
Riversidian Sage Scrub	BLM	3.15	0.34	0.34	0.04	0.04	1.2%
Riversidian Sage Scrub	State of California	137.89	15.12	15.28	2.82	4.26	3.1%
Riversidian Sage Scrub	Private	161.52	17.88	18.15	3.19	4.59	2.8%
Riversidian Sage Scrub	USFS	55.49	5.96	5.96	1.20	1.98	3.6%
Southern Coast Live Oak Riparian Forest	Private	0.68	0.07	0.07	0.01	0.01	1.5%
Southern Coast Live Oak Riparian Forest	USFS	6.11	0.66	0.66	0.08	0.08	1.3%
Southern Cottonwood Willow Riparian Forest	State of California	0.30	0.03	0.03	0.01	0.01	3.3%
Southern Cottonwood Willow Riparian Forest	USFS	7.49	0.80	0.80	0.21	0.40	5.3%
Southern Sycamore Alder Riparian Woodland	Private	1.81	0.19	0.19	0.05	0.10	5.5%
Southern Sycamore Alder Riparian Woodland	USFS	1.78	0.19	0.19	0.05	0.09	5.1%

*The disturbance estimates for reconductoring and new conductoring are likely to be overestimates, as they are based on the disturbance impact model used for the new transmission line.

The Barren Ridge Switching Station expansion would consist of permanently impacting 2.7 acres of Mojave Creosote Bush Scrub (Appendix B). The new Haskell Canyon Switching Station (6 acres) would permanently disturb Riversidian Sage Scrub (Appendix C).

5.1 DATA COLLECTION

Collection of biological resources baseline data in the Project area included a review of applicable documents and the identification of resources during several aerial, reconnaissance-level surveys and focused pedestrian surveys conducted by authorized biologists. During the development of alternative corridors for the proposed Project, reconnaissance surveys were conducted on every segment. The surveys consisted of a reconnaissance-level survey conducted aerially from a helicopter or on the ground within a 0.5-mile wide buffer of the proposed transmission line corridor where access was available.

Vegetation community mapping was conducted using the California Gap Analysis Program (GAP), 2005 aerial imaging from the National Agriculture Imagery Program (NAIP) California spatial library, and California Natural Diversity Database (CNDDB) data. USFS Geographic Information System (GIS) habitat data were used as the basis for the habitat-based assessment of the Project action area corridors. GIS data layers were mapped within the action area corridors (one mile wide biology study corridor) and plotted. The vegetation mapping was conducted using the GAP data but later refined based on field reconnaissance surveys. The reconnaissance-level surveys were conducted in 2008 prior to the protocol surveys being conducted.

Information gathered from the literature review and reconnaissance-level field surveys were used to identify habitat for all threatened and endangered plant and wildlife species with potential to occur within the Project area (Appendices A – E). Protocol surveys were conducted in the spring and summer of 2008, 2009 and 2010 on all Project components not covered in dense chaparral, at a distance of 250 feet either side of the proposed centerline and along existing access roads, to assess the presence of special-status plant and wildlife species (POWER 2010).

5.2 PROTOCOL SURVEYS

Information gathered from the literature review and reconnaissance-level field surveys were used to identify habitat for all threatened and endangered plant and wildlife species with potential to occur within the Project area. Protocol-level surveys were conducted in the spring and summer of 2008, 2009, and 2010 on all segments to assess the presence of special-status plant and wildlife species (see BRRTP Biological Resources Technical Report appendices).

The surveys were 150 meters (500 feet) wide (250 feet on each side of centerline). Amphibian species and their potential habitat were surveyed up to five miles from the centerline to describe the potential of indirect impacts from construction activities (see BRRTP Biological Resources Technical Report Appendix E). The amphibian site assessment forms were submitted to USFWS and USFS to review. Surveys were conducted based on the site assessment forms and agency feedback.

Prior to conducting field surveys, USFS, USFWS and BLM were consulted to determine survey needs and appropriate survey time frames. Protocol-level surveys were conducted for the arroyo toad and California red-legged frog, federal- and State-listed plant species, Forest Service Sensitive/Watch plant species, and CNPS List 1 and 2 species. Surveys were also conducted to determine presence of and suitable habitat for California spotted owl, Joshua trees, special-status bat species, and special-status riparian bird species. Additionally, desert habitat and invasive weed surveys were conducted, along with an avian risk assessment (see BRRTP Biological Resources Technical Report Appendices E through N for survey reports).

Table 7 identifies the species for which protocol-level surveys were conducted for the Proposed Action and segments. Table 7 also identifies the appropriate timeframes for protocol surveys as specified by managing entities and includes the location by segment for each.

TABLE 7. PROTOCOL SURVEYS CONDUCTED 2008-2009

Species Scientific Name	Common Name	Survey Protocol	Survey Locations 2008-2009¹
Bufo californicus	Arroyo Toad	Six site visits should be made between March 15 and Jul 1 with seven days between site visits. If toads are discovered, the survey should cease. One site visit should be made in April, May, and June; night and daytime surveys should be conducted within the same 24-hour period.	• Segment D • Segment G • Dry Canyon • San Francisquito Canyon • Segment H
Rana aurora draytonii	California Red-Legged Frog	Four daytime and four nighttime aquatic and terrestrial habitat surveys for juvenile and adult frogs. Surveys should be conducted June through September and include a non-breeding survey.	• Segment G • Segment H • Dry Canyon • San Francisquito Canyon
Strix occidentalis occidentalis	California Spotted Owl	March 15 through August 31, this includes 3 site visits.	• Segment D • Segment G • Segment H • Segment J

5.2.1 Special-Status Plant Surveys

Botanical surveys were conducted in 2008, 2009 and 2010 with the goal of locating and mapping special-status plants throughout the Project area (see BRRTP Biological Resources Technical Report Appendix F). The surveys were floristic, meaning that all plants observed were identified to the taxonomic level needed to determine whether they were special-status plant species. Exceptions to this included instances where characteristics essential for identification were not present during the field survey period. Botanists identified all plant species detected during field surveys using personal knowledge of the plants and keys in *The Jepson Manual* (Hickman 1993). Scientific nomenclature in this report mainly follows Hickman (1993). Common names are derived from Hickman (1993) and CalFlora (2008). The survey methodology generally followed the U.S. Fish and Wildlife Service's (USFWS) *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996a), and the recommended botanical survey guidelines of the California Department of Fish and Game (CDFG 2000) and the California Native Plant Society (CNPS 2001). Areas with dense, impenetrable chaparral, and areas with very steep slopes that posed a safety hazard to surveyors, were not surveyed. Within the surveyed segments, botanists used an intuitive approach to determine the route taken during meandering transects. The intuitive approach, recommended by USFS Botanist Katie VinZant, uses the botanist's knowledge of the preferred habitat of special-status plants to focus the survey effort on sites most likely to support them.

The 2009 surveys covered both the proposed access roads and 500-foot survey corridor in the section of the redesigned alignment that were not surveyed in 2008. All access roads were limited to a 20-foot buffer zone on either side of the proposed route, including the spur roads to existing transmission lines.

The botanical surveys were performed during the time of year that most species would be detectable on both USFS land and BLM-managed land. Segments A, D, G, I, J and H were surveyed for special-status plant species along a 500-foot corridor. Private property was not surveyed. Additional data was also gathered from USFS botanists and from Southern California Edison's (SCE) Antelope Pardee project, which overlaps with the BRRTP area. Many large areas that were surveyed in 2008 had burned in 2007 or within the last five years and the resulting increase in species abundance and diversity of annual and perennial herbs was observed in these areas. However, it is also possible that the plant species' diversity and density observed during the 2008 and 2009 surveys in the unburned portions of the Project area were lower than what would be seen in an optimal year.

Botanists recorded species observations with Trimble GEO-XT hand-held Global Positioning System (GPS) units using Terrasync software. These units were pre-loaded with maps of the proposed transmission line corridors, buffers, and USGS topographic maps as background files. GPS units were used for navigation, and to collect locational data (points and polygons) when special-status plant species were found.

5.2.2 Special-Status Amphibian Surveys

In preparation for surveys for special-status amphibians, current maps of alternative transmission segments for the Project were developed and CNDDB records downloaded for locations of special-status amphibians and critical habitat. Areas along the segments were visited in April and early May 2008 to assess areas to survey. More areas were surveyed in late May and June 2008 as proposed segment corridors moved, or areas were found by other biologists (such as botanists) that suggested possible amphibian habitat due to the presence of ponded water and tadpoles. Protocol surveys were initiated in 2008 and continued in 2009 for the California red-legged frog and the arroyo toad (see BRRTP Biological Resources Technical Report Appendix E). Surveys were continued in 2010 for the arroyo toad, but not for the California red-legged frog.

Many of the transmission corridors are on high, dry, rugged ridges, and most of the amphibian habitat in the ANF mountains occurs on canyon bottoms in creeks and unnamed tributaries. Concern has been expressed by the ANF about indirect impacts to sensitive-species amphibians, including disturbance such as sediment runoff flowing downhill from transmission line construction activity into drainages below. This concern was taken into account when assessing possible impacts of transmission line construction on the amphibian species of concern.

For the arroyo toad, the protocol states that areas within one kilometer of known arroyo toad sites shall be considered occupied. Thus, overall, one mile from the proposed segment was considered when searching for potential special-status amphibian species habitat. Further, potential impacts of transmission line construction, including tower assembly and installation or replacements, were taken into account in relation to the rugged topography of the mountains. When stream habitat was near or directly downslope from the proposed transmission line segments, sites were assessed for potential impact to sensitive-species amphibians. When a stream was within one mile of a transmission segment, but separated by several drainages and ridges, it was not considered as an area where indirect impacts were probable or possible.

The California red-legged frog protocol calls for eight surveys: six nocturnal and two diurnal. At least two of the surveys (one diurnal and one nocturnal) must be completed during the non-breeding season from July 1 to September 30. The other surveys must be completed during the breeding season from January 1 to June 30 (USFWS 2005b). The arroyo toad protocol calls for six surveys, each consisting of a diurnal and nocturnal portion, conducted during the breeding season from March 15 to June 30 (USFWS 1999b).

5.2.3 Desert Habitat Assessment

As part of efforts to determine potential habitat usage of the Project area by desert tortoise, Mohave ground squirrel, kit fox, and burrowing owl, biologists recorded data on disturbance quality and quantity and vegetation composition while walking meandering transects within the survey corridors, including Segments A, B, C, D, E, F1, F2, H1, 115th and the desert portion of I (see BRRTP Biological Resources Technical Report, 2011). Species presence as detected by direct observation of animals, burrows, calls, tracks, scat, or other sign were also noted and their locations recorded using GPS. The majority of the surveys were conducted on foot; however, when disturbance was high, or development was present, vehicles were used in order to maximize efficiency. Areas that were marked as private property or to which access could not be safely obtained were not surveyed.

5.2.4 Avian Habitat Assessment

Surveys were conducted on ANF in June and August 2008 to evaluate suitable habitat for special-status bird species, including southwestern willow flycatcher, least Bell's vireo, western yellow-billed cuckoo, and coastal California gnatcatcher (see BRRTP Biological Resources Technical Report, 2011). Pre-field work included reviewing aerial photographs of the ANF and searching for existing recorded occurrences. Surveys occurred on Segments D, G, H, I, and J within 500-foot corridors. Potential habitat was defined as habitat that can support both breeding and foraging needs of the species. Both pedestrian and vehicular surveys were conducted as situations dictated. Particular attention was given to areas with previous records of special-status bird species and to riparian and coastal sage scrub habitats. Habitat was recorded with datasheets, photos, and GPS points that were subsequently incorporated into a GIS database.

6.0 SPECIES ACCOUNTS AND STATUS OF SPECIES IN THE ACTION AREA

This section provides an overview of the listing status, ecology and local distribution for the sixteen species identified by USFWS, and three additional identified plant species, that may be affected. The information is based on relevant literature, recovery plans, and data provided by USFS, USFWS or BLM. Data from recent project area surveys conducted from 2008 through 2010 are included, as appropriate. Refer to Appendices A – E for maps of the biological resources for each of the Project components.

6.1 PLANTS

The USFWS species list indicated that four federally listed species have the potential to occur. However, based on habitat surveys conducted, records search, and discussion with the ANF and BLM, an additional three federally listed species of plants were identified with the potential to be impacted.

6.1.1 Braunton's milk-vetch

Regulatory Status

Braunton's milk-vetch (*Astragalus brauntonii*) is federally listed as endangered (62 FR 4172 4183), and placed on List 1B.1 by the CNPS (CNPS 2011). Braunton's milk-vetch is endemic to Southern California, and has been documented only in Los Angeles and Orange Counties. Braunton's milk-vetch is threatened by development, vegetation/fuel management activities, and alteration of local fire regimes (CNPS 2011).

Critical Habitat

There is no designated critical habitat for this species within the Project area (71 FR 66374 66423).

Life History and Habitat Requirements

Braunton's milk-vetch is a short-lived perennial shrub in the legume family (*Fabaceae*) that typically occurs in fire-afflicted areas in dry, open chaparral below 2,100 feet in elevation. Braunton's milk-vetch was historically found in gravelly clay soils overlaying granite and sandstone, but is currently associated with carbonate soils derived from scattered limestone lenses; soil specificity accounts for its limited distribution. Braunton's milk vetch typically appears the spring following a chaparral fire, living for a few years before senescing or being crowded out by developing vegetation (Skinner 1991). Braunton's milk-vetch has white, wooly foliage with bright purple inflorescences blooming from January through August and can reach a height of six feet.

Survey Results

This species was not identified during botanical surveys conducted for this Project in 2008, 2009, and 2010. Suitable habitat was identified within the Project area, but soil requirements would reduce its likelihood to occur. It is known from 34 recorded occurrences in CNDDB, none of which is in the Project's vicinity (CDFG 2011a). The Consortium of California Herbaria (CCH) lists 47 specimens, 27 of which are from Los Angeles County (CCH 2011).

Distribution and Occurrence in Project Area

CNDDB lists 34 occurrences of this species (CDFG 2011a). There are no known populations of this species near the Project area, but there are extensive areas vegetated with chaparral that burned in 2007. Based on its geographic range and habitat preferences, Braunton's milk-vetch has a potential to occur on the proposed new 230 kV line and the reconductoring section that would parallel the proposed new 230 kV line. However, its soil requirements would likely restrict this species to a lower probability of occurrence. Braunton's milk-vetch was not observed during botanical surveys conducted for this Project in 2008, 2009, or 2010 on ANF lands (Appendix E).

6.1.2 Nevin's barberry

Regulatory Status

Nevin's barberry (*Berberis nevinii*) is federally and State listed as endangered (63 FR 54956 54971, CDFG 2011b), and placed on List 1B.1 by the CNPS (CNPS 2011).

Critical Habitat

There is no designated critical habitat for this species within the Project area (73 FR 8411 8440).

Life History and Habitat Requirements

Nevin's barberry (*Berberis nevinii*) is a yellow-flowered evergreen rhizomatous shrub in the barberry family (*Berberidaceae*). It reaches three to twelve feet in height and re-sprouts vigorously after fire. It blooms from March to June (CNPS 2011). Nevin's barberry grows in small, discrete, localized populations in two habitat types: sandy and gravelly places along the margins of dry washes, and coarse soils in chaparral. It ranges from 900 to 2,700 feet in elevation (Hickman 1993, USFS 2005). This species appears to have a low fecundity due to sporadic production of viable seed (USFS 2005). Threats to the species include naturally small population sizes, wildfire suppression activities, development, road maintenance, and illegal trash dumping (USFS 2005, CNPS 2011). Nevin's barberry is endemic to southern California, and has been documented in Los Angeles, San Bernardino, and Riverside Counties. Its range extends from the foothills of the San Gabriel Mountains to the foothills of the Santa Ana and Palomar Mountains (USFS 2005). The CNDDB (CDFG 2011a) lists 34 occurrences for this species, two of which are on the ANF. The USFS (2005) estimated that the total population size was between 500 and 1,000 plants.

Survey Results

This species was not identified during botanical surveys conducted for this Project in 2008, 2009, and 2010. However, a population is known to be present around LADWP's Power Plant 2 in San Francisquito Canyon and suitable habitat was identified within the ROW. A second population is known within the ANF in Lopez Canyon. CNDDB lists a total of 34 recorded occurrences of this species (CDFG 2011a), while CCH lists 150 specimens, including 73 that are from Los Angeles County (CCH 2011).

Distribution and Occurrence in Project Area

In 2005, there were two confirmed population occurrences totaling 138 acres within the ANF, in San Francisquito and Lopez canyons. There is a known population of this species near LADWP Power Plant #2 in San Francisquito Canyon, which is adjacent to the proposed new 230 kV line. No individuals of this species were found during botanical surveys conducted for this Project in 2008, 2009 and 2010 on ANF lands. However, based on its geographic range, habitat preferences, and consultation with USFS, Nevin's barberry has a likely potential to occur on the proposed new 230 kV line and the reconductoring component that would parallel the proposed new 230 kV line.

6.1.3 San Fernando Valley spineflower

Regulatory Status

San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) is a candidate species for federal listing, and is State-listed as endangered (CDFG 2011b). The CNPS online Inventory (CNPS 2011) includes it on List 1B.1, and the USFS tracks it as a "sensitive" species.

Critical Habitat

Because this species is a candidate for listing, no critical habitat has been designated.

Life History and Habitat Requirements

San Fernando Valley spineflower is a white-flowered annual herb in the Buckwheat Family (*Polygonaceae*) that blooms from April to July (CNPS 2011). It occurs in sandy places associated with coastal scrub, valley and foothill grassland, from 490 to 4,000 feet (Hickman 1993, CNPS 2011, USFS 2005). Threats include urban development on private land and invasive non-native plants (CNPS 2010).

Survey Results

This species was not identified during botanical surveys conducted for this Project in 2008, 2009, and 2010. Although there are 20 recorded occurrences of this species within CNDDB, ten of which are in the Project vicinity, none of these is within the ANF (CDFG 2011a). However, suitable habitat was identified for this species within the Project area, which is within the species' range. CCH lists 60 specimens for this species, mostly collected from Los Angeles County (CCH 2011).

Distribution and Occurrence in Project Area

San Fernando Valley spineflower is endemic to the Los Angeles Basin and neighboring valleys and mesas (CNPS 2011, USFS 2005). Most of its former range in Los Angeles and Orange Counties has been developed. The CNDDB (CDFG 2011a) lists 20 occurrences for this species, of which 11 are noted as *presumed extant* and the other nine are noted as *possibly extirpated*. Ten of the presumed extant locations are within the vicinity of the Project area (e.g., Newhall Ranch, Castaic, and Magic Mountain). There are no known or historic locations for San Fernando Valley spineflower from ANF lands. Based on current range and habitat preferences, this species has a likely potential to occur within the Project area. No individuals of San Fernando Valley spineflower were located during 2008, 2009, and 2010 protocol-level surveys conducted for this Project on ANF lands.

6.1.4 Slender-horned spineflower

Regulatory Status

Slender-horned spineflower (*Dodecahema leptoceras*) is federally and State listed as endangered (52 FR 36265 36270, CDFG 2011b). The CNPS online Inventory (CNPS 2011) includes it on List 1B.1.

Critical Habitat

There is no designated critical habitat for this species (USFWS 2010b).

Life History and Habitat Requirements

Slender-horned spineflower (*Dodecahema leptoceras*) is a pink-flowered annual herb in the Buckwheat Family (*Polygonaceae*) that blooms from April to June (CNPS 2011). Slender-horned spineflower grows on sandy soils of alluvial fans and stream terraces within chaparral, cismontane woodland and coastal scrub from 650 to 2,500 feet (Hickman 1993, CNPS 2011). Most occurrences are on flood-deposited river terraces associated with later successional stages of alluvial scrub habitat (USFS 2005). Current threats include alteration of fire regimes, development, sand and gravel mining, flood control, foot traffic, proposed reservoir construction, recreational activities, vehicles, and invasive non-native plants (CNPS 2011).

Survey Results

This species was not identified during botanical surveys conducted for this Project in 2008, 2009, and 2010. Suitable habitat was identified for this species within the ROW, but no occurrences are recorded within the Project area. One historic occurrence from 1893 is known from the Project's vicinity (CDFG 2011a). CCH lists 72 specimens for this species, 20 of which are from Los Angeles County (CCH 2011).

Distribution and Occurrence in Project Area

Slender-horned spineflower is endemic to the coastal sides of the Transverse and Peninsular ranges in Los Angeles, Riverside, and San Bernardino Counties. The CNDDB (CDFG 2011a) lists 35 occurrences, the majority occurring in Riverside and San Bernardino Counties. There is a potential for one occurrence record, in Big Tujunga Wash, that may extend into the southern part of the ANF (CDFG 2011a). One historic location, from 1893, is known from a non-specific location in the vicinity of Newhall; this location is in the vicinity of the Project area (CDFG 2011a). Many historical occurrences of slender-horned spineflower were lost to urbanization and stream channelization.

Based on current range and habitat preferences, slender-horned spineflower has a likely potential to occur on the proposed new 230 kV line route. Marginally suitable habitat may occur within chaparral and scrub habitat within the Project area. One historic location (1893) is known within the vicinity of the Project area. No individuals of slender-horned spineflower were located during 2008, 2009, and 2010 protocol-level surveys conducted for this Project on ANF lands.

6.2 BIRDS

6.2.1 California Condor

Regulatory Status

California condor (*Gymnogyps californianus*) is listed as a federal and State endangered species (32 FR 4001, CDFG 2011c).

Critical Habitat

No designated critical habitat for the California condor located is within the Project area (42 FR 47840 47845). Designated critical habitat is located approximately two miles west of the Project area in the Sespe-Piru Condor Area and approximately four miles north at Tejon Ranch.

Life History and Habitat Requirements

The California condor is a habitat generalist, nesting in areas as diverse as chaparral and snow-covered montane forests. Nesting sites typically occur in cliff cavities and large rock outcrops, and large trees and roosting sites are usually nearby (Snyder and Schmitt 2002, USFWS 1996). Both types of sites require isolation from human disturbance. Foraging tends to occur in relatively open foothill grasslands and oak savannah habitats, somewhat separate from nesting habitat. Occasionally, densely vegetated areas may be used, and possibly even in chaparral and forest, though this has not been very abundantly observed. Condors require sufficient food availability, open habitat to locate and reach food sources, and consistent thermal wind patterns for soaring. Because of their large mass, condors tend to only flap their wings during takeoff and landing, meaning that foraging usually only occurs when there are winds strong enough to sustain flight.

Pair formation generally begins in December and lasts throughout spring. Once a pair forms, they will remain together year-round for life. Several weeks prior to egg-laying, a network of alternate nest sites are visited until one is selected by the female. Nest investigations consist of the pair entering the site and spending several hours moving organic substrate about with their bills and feet in the area where egg-laying will occur (Snyder and Schmitt 2002). The network of nest sites used by a single pair may be distributed over an area many miles in diameter. After females select a suitable nest, they lay a single egg (averaging 281 grams), usually between early January and early April (Snyder and Schmitt 2002). Incubation is a cooperative "tag-team" effort between parents and lasts from 53 to 60 days (Snyder and Schmitt 2002), resulting in the hatching of a white downy chick with open eyes.

Nestlings are brooded by both parents nearly constantly for the first two weeks, after which there is a rapid decline until only erratic night-brooding occurs from about one month of age (Snyder and Snyder 2000). During the initial two-week period, parents invest a large amount of time feeding, grooming and inspecting their young when not brooding. Feeding, like all other parental duties, is performed by both parents and is accomplished by regurgitation (Snyder and Snyder 2000). After one month of age, attendance by parents declines substantially to stabilize at a level that will be maintained until fledging occurs at approximately six months of age. Post-fledging care by parents lasts approximately six months and consists of intermittent feedings with ever-growing time lapses between each occurrence. This prolonged parental care is most likely the reason that condors do not breed annually on a regular basis.

Condors feed primarily on mammalian carrion, and occasionally on the remains of reptiles and birds. In recent years this diet has ranged from large to relatively small prey, and has included domestic animals, mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), ground squirrels (*Spermophilus* spp.), common gray foxes (*Urocyon cinereoargenteus*), long-tailed weasels (*Mustela frenata*), kangaroo rats (*Dipodomys* sp.), and Botta's pocket gophers (*Thomomys bottae*) (Snyder and Schmitt 2002; USFWS 1996).

Survey Results

No surveys were conducted for this species for this Project. Instead, USFWS supplied coordinates for California condor flights in the Project vicinity in 2008 (USFWS 2008b) and 2009 (USFWS 2009a). There is suitable habitat for this species throughout much of the Project area, and according to the USFWS location data California condors are most prevalent around the Tehachapi Mountains, along the far western side of the Project, and in the mountains south of the Project.

Distribution and Occurrence in Project Area

California condors are found locally northwest (Tehachapi Mountains), southwest (Piru Lake), and south (San Gabriel Mountains) of the Project area, and have been sighted in numerous locations within the Project area (Appendix D) (USFWS 2008b, USFWS 2009a). Local populations of condors are not yet considered to be self-sustaining (Snyder and Schmitt 2002). Within the Project area, condors have been recorded the most on the southern end of the proposed reconductoring component route just south of the ANF, and near Castaic Power Plant (Appendix D). Although they were not identified during any Project surveys between 2008 and 2010, California condors are expected to be present in the general Project area.

6.2.2 Coastal California Gnatcatcher

Regulatory Status

The coastal California gnatcatcher (*Polioptila californica californica*) is a federal Threatened species and Department of Fish and Game Species of Special Concern (58 FR 65088 65096, CDFG 2011c).

Critical Habitat

Designated critical habitat for the coastal California gnatcatcher is located within the Project area within the proposed reconductoring component route just south of the ANF (72 FR 72010 72213). Approximately 2.9 miles of the Project is within Unit 13 of the designated critical habitat for the coastal California gnatcatcher (Appendix D).

Life History and Habitat Requirements

The coastal California gnatcatcher is an obligate permanent resident of low coastal sage scrub—including Diegan, Riversidian, and Venturan sub-associations—in arid washes on mesas and slopes in Southern California (Atwood and Bontrager 2001). In Los Angeles County, coastal California gnatcatchers typically inhabit below 500 meters in elevation. Nests are built in shrubs, with the first eggs appearing in late March. Second broods may be possible, depending on timing of the first and duration of the breeding season. Diet mainly consists of arthropods.

Survey Results

This species was not identified during avian habitat assessment surveys conducted in 2008. Suitable habitat was identified during the surveys within and around the corridor for the new 230 kV circuit

(POWER 2009). Additionally, POWER identified at least one individual on multiple occasions during winter 2009/2010 within the Project ROW south of critical habitat Unit 13. There are multiple occurrences recorded in the Project vicinity in CNDDB (CDFG 2011a).

Distribution and Occurrence in Project Area

Its entire range extends from coastal Southern California to Baja California. At least one coastal California gnatcatcher was observed within the Project area on the proposed reconductoring route south of the ANF during winter 2009/2010, and this species is expected to be present.

6.2.3 Southwestern Willow Flycatcher

Regulatory Status

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a State- and federally listed Endangered species (CDFG 2011c). It was listed by the State of California in 1992 (Rourke et al. 2004) and by USFWS in 1995 (60 FR 10693 10715).

Critical Habitat

There is no proposed or designated critical habitat for the southwestern willow flycatcher located within the Project area (76 FR 50542 50629). The closest proposed critical habitat for this species is in the Santa Clara River, where a 49.4-mile section of the river has been proposed. This proposed area terminates approximately 2.1 miles west of the Project. The closest designated critical habitat for this species is the Kern Management Unit, located approximately 32 miles north of the existing Barren Ridge Switching Station and immediately east of Lake Isabella.

Life History and Habitat Requirements

Southwestern willow flycatcher breeding habitat is characterized by dense riparian areas along slow-flowing or still water, specifically near surface water or amidst saturated soil (USFWS 2002a, BLM 2006). This habitat typically occurs along lower gradient streams and/or open valleys, as opposed to fast-moving or narrow streams (USFWS 2002a). Breeding habitat vegetation is usually composed of species such as willows, boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), and Russian olive (*Eleagnus angustifolia*) (USFWS 2002a), with the two most common dominants being willow and tamarisk (Durst et al. 2007). Approximately half of the known southwestern willow flycatcher territories are dominated by native plant species, which may include various willow species, cottonwood, boxelder, ash (*Fraxinus* sp.), alder (*Alnus* sp.), and/or buttonbush (*Cephalanthus occidentalis*) at lower elevation sites; at higher elevation sites vegetation is usually dominated by a willow species (USFWS 2002a). While lower elevation sites will usually contain distinct overstories and understories, higher elevation sites typically do not. Habitat patches that are mostly composed of non-native species are usually dominated by tamarisk or Russian olive. At sites of mixed native and non-native plants, the understory is typically dominated by non-native plants and the overstory by native plants. Canopy height tends to be inversely related to elevation, with trees and shrubs ranging from 2 to 30 meters in height. The shrub layer and the canopy are typically dense, with the vertical area in between variable in density (Sogge et al. 1997, USFWS 2002a). Breeding territory size can be from 0.25 to 5.7 acres, with most between 0.5 to 1.2 acres. Territories of polygynous males are usually larger than those of monogamous males and will generally consist of two females and one male. Southwestern willow flycatchers are not known to nest in habitat that is less than 10 meters wide except uncommonly when such patches extend out from larger, wider patches (Sogge et al. 1997, USFWS 2002a).

Breeding season for southwestern willow flycatcher generally occurs during spring and summer (USFWS 2002a, BLM 2006). Pairs are usually formed up to two weeks after completion of migration, with nest-building commenced by the female within another week. Clutches are generally laid anywhere between May 24 to July 31 depending on specific location and population, although no viable clutches are known to have been laid past July 16. Second clutches are uncommon if first clutches are successful (Sogge et al. 1997, USFWS 2002a). Pairs may build up to three nests within a single breeding season if the first two fail, although clutch size decreases with each instance. Incubation typically lasts 12 to 13 days from the time that the last egg is laid, with fledging occurring 12 to 15 days after that. In all, the time from spring arrival to final fledging is generally from early May to late August, although this may vary a week or more in any given year or site (USFWS 2002a). Pairs at lower elevations or in southern populations usually begin breeding several weeks earlier than those at higher elevations or in northern populations.

Little is known about southwestern willow flycatcher migration or wintering habits, although it is known that all subspecies of willow flycatcher overwinter in Mexico, Central America, or northern South America (Sogge et al. 1997, USFWS 2002a, BLM 2006). Characteristics of willow flycatcher wintering habitat include lentic water and associated vegetation, patches of dense woody shrubs, patches and/or stringers of trees, and open or semi-open areas (USFWS 2002a). Southern migration for the southwestern willow flycatcher generally occurs from late July to late September, with northern migration occurring from mid-April to mid-June.

Survey Results

This species was not identified during avian habitat assessment surveys conducted in 2008. Suitable habitat was identified during the surveys in San Francisquito, Dry, and South Portal Canyons (POWER 2009). In 1999 (Tierra Madre Consultants 1999) and 2001 (PCR Services Corporation 2001) willow flycatchers were identified in San Francisquito Canyon by Tierra Madre Consults and PCR Services Corporation, respectively. However, due to the timing of the surveys, the birds were indistinguishable to subspecies. There are no recorded occurrences of this species in the Project vicinity in CNDDB (CDFG 2011a).

Distribution and Occurrence in Project Area

As of 2006, USGS estimated 190 southwestern willow flycatcher territories in California, down from an estimated high of 220 in 2002 (Durst et al. 2007). Most southwestern willow flycatcher territories can be found along the South Fork of the Kern River, along the Owens River between Pleasant Valley Reservoir and Warm Springs Road, along the San Luis Rey River downstream of Lake Henshaw, and along the Santa Margarita River at Camp Pendleton (USFWS 2002a).

Willow flycatchers were observed in San Francisquito Canyon during separate surveys in 1999 and 2001 by Tierra Madre Consultants (Tierra Madre Consultants 1999) and PCR (PCR Services Corporation 2001). However, due to the timing of the 2001 surveys, the birds were indistinguishable to subspecies as all subspecies of northbound willow flycatchers may potentially migrate through San Francisquito Canyon during the survey period. Additionally, 2008 habitat surveys identified suitable habitat for this species in two different locations: Dry Canyon and San Francisquito Creek (POWER 2009). Dry Canyon is a wide canyon with a sandy and rocky base. It contains an abundance of willow and mulefat, along with larger trees such as cottonwoods. San Francisquito Creek contains intermittent sections of dense riparian vegetation and wide, open-canopy streambed. These are tributaries to the Santa Clara River, where there have been sightings in the past. Southwestern willow flycatcher is expected to have a possibility of occurring along the proposed new 230 kV line route and reconductoring component that would parallel the proposed new 230 kV line.

6.2.4 Least Bell's Vireo

Regulatory Status

Least Bell's vireo (*Vireo bellii pusillus*) is a State and federal Endangered species and a USFWS Bird of Conservation Concern (CDFG 2011c). It was listed by the California Fish and Game Commission in 1980 (Kus 2002) and by USFWS in 1986 (51 FR 16474 16482). The designation as a Bird of Conservation

Concern is given to the Bell's vireo species as a whole, not specifically to the least Bell's vireo subspecies (USFWS 2008d).

Critical Habitat

There is no designated critical habitat for this species located within the Project area. Designated critical habitat Unit B is located approximately 5.5 miles west of the Project area within the Santa Clara River (59 FR 4845 4867).

Life History and Habitat Requirements

Least Bell's vireo has similar breeding habitat requirements to the southwestern willow flycatcher. Least Bell's vireos require a dense understory for nesting and a dense canopy for foraging, and are typically found in riparian habitat dominated by willow species (USFWS 1998b). When suitable upland habitat is adjacent to riparian habitat within a pair's territory, pairs have been known to nest within the upland habitat, especially following extensive flooding of riparian areas. Least Bell's vireo has also been observed to use upland habitat for foraging, specifically focusing on laurel sumac (*Malosma laurina*) and elderberry (*Sambucus mexicana*) for food sources. While individuals may winter in riparian woodlands, they are more likely to winter in arroyos within mesquite scrub vegetation, in shrubby areas with palm groves, in agricultural hedgerows, and in rural residential areas. Least Bell's vireo may migrate as far as 2,000 miles to southern Baja California (USFWS 1998b, Kus 2002).

Least Bell's vireo breeding season generally encompasses spring and summer. They begin arriving at breeding grounds in mid-March and early April. Most individuals will depart in late July through late September but some will remain in their breeding territories into the fall or even over the winter (USFWS 1998b). Breeding territories range in size from 0.5 to 7.5 acres. Nests are usually constructed within one meter of the ground, with construction beginning a few days after pairs form and lasting over four to five days. Eggs take about two weeks to hatch, with an additional 10 to 12 days until young have fledged. Pairs may construct up to five nests during a single breeding season, but typically raise only one or two clutches (Kus 2002).

Survey Results

This species was not identified during avian habitat assessment surveys conducted in 2008. Suitable habitat was identified during the surveys in San Francisquito, Dry, and South Portal Canyons (POWER 2009). There are multiple occurrences recorded in CNDDB, the closest being a population at Castaic Lagoon that was identified during ten recurring visits in 2005 (CDFG 2011a). Several other occurrences are mapped within San Fernando and the Santa Clara River.

Distribution and Occurrence in Project Area

The historical range of the least Bell's vireo encompassed coastal Southern California, the Owens Valley and Death Valley, the Sacramento and San Joaquin Valleys, and coastal Baja California. The current range is estimated to encompass only the coastal areas of Southern California and Baja California (USFWS 1998b). There are no known least Bell's vireo populations within the Project area. However, in 2005, least Bell's vireo individuals were observed by biologists from BonTerra Consulting during ten separate site visits to a location approximately 0.5 mile south of the proposed reconductoring component area at Castaic Lagoon; the highest number of birds counted during a single visit was 15 individuals, including adults and juveniles (CDFG 2011a). Suitable habitat was identified in Dry Canyon by biologists from Garcia and Associates during 2008 habitat surveys within the new ROW for the proposed 230 kV transmission line (POWER 2009). Least Bell's vireo is expected to be present in the area around the reconductoring component near Castaic Lake, and have a possibility of occurring in the proposed new 230 kV transmission line area.

6.2.5 Western Yellow-billed Cuckoo

Regulatory Status

The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a federal Candidate, State Endangered, and USFS Sensitive species, as well as a Fish and Wildlife Service Bird of Conservation Concern (CDFG 2011c).

Critical Habitat

This species is a Candidate for listing and does not have any designated critical habitat.

Life History and Habitat Requirements

This species inhabits nests in riparian forests along the broad, lower flood-bottoms of larger river systems. It prefers to nest in willow and cottonwood forests with understories of blackberry, nettles, or wild grape (Hughes 1999, 66 FR 38611 38626). In California, cottonwood trees have been observed to be of particular importance to western yellow-billed cuckoos for foraging (66 FR 38611 38626). California individuals have also been observed to occupy large areas of riparian habitat, with home range studies (66 FR 38611 38626) on the Sacramento River averaging approximately 25 acres of riparian habitat for nesting pairs in one section of the river and 99 acres per pair in another section of the river. A separate study on the South Fork of the Kern River reported home ranges of approximately 42 acres per pair (66 FR 38611 38626).

Western yellow-billed cuckoos typically arrive at their breeding grounds starting in mid- to late May, but are not present in notable numbers until early to mid-June and have been recorded arriving through mid-July (Hughes 1999). The western yellow-billed cuckoo generally breeds from June to August, peaking from mid-July to August (Hughes 1999). Second broods are typically not observed in western yellow-billed cuckoos due to the short nesting season (Hughes 1999, 66 FR 38611 38626). Individuals begin leaving their breeding grounds in late August and continue typically through mid-September, although individuals have been observed up to November.

Survey Results

This species was not identified during avian habitat assessment surveys conducted in June and August of 2008. Suitable habitat was identified during the surveys in San Francisquito, Dry, and South Portal Canyons (POWER 2009). CNDDB shows two recorded occurrences of western yellow-billed cuckoo around the Project area, one from 1893 that is extirpated in San Fernando and one from 1979 in the Santa Clara River (CDFG 2011a).

Distribution and Occurrence in Project Area

The western yellow-billed cuckoo's historical distribution extended from southern Canada to northern Mexico, occupying most of North America (66 FR 38611 38626). The current distribution of breeding western yellow-billed cuckoos within California has a northern limit of the Sacramento Valley. There are no recently recorded sightings of this species within the Project area. Suitable habitat was identified during the 2008 surveys within San Francisquito Canyon and Dry Canyon, but these areas are not known to be occupied. These two creeks are ultimately tributaries to the Santa Clara River, where there are historical occurrences of this species. Western yellow-billed cuckoo is expected to have a possibility of occurring within the Project area, in areas of suitable habitat.

6.3 REPTILES

6.3.1 Desert Tortoise

Regulatory Status

Desert tortoise (*Gopherus agassizii*) is federal and State listed as a Threatened species (55 FR 12178 12191, CDFG 2011c).

Critical Habitat

There is no designated critical habitat for the desert tortoise located within the Project area. The nearest critical habitat is located approximately 10 miles northeast of the Barren Ridge Switching Station (59 FR 5820 5866).

Life History and Habitat Requirements

Desert tortoises are known to occur from near sea level to approximately 5,300 feet in elevation (Stebbins 2003). They inhabit desert or semi-desert ecosystems, and in the Mojave Desert prefer creosote/burrobush habitat, desert grassland, saltbush scrub, yuccas, shrub-steppe habitat, and Joshua tree woodland (Berry 2008). Tortoises will construct burrows in firm sand, typically at the base of bushes, or else use rocks for shelter or caves in well-developed calcic layers. In some instances, burrows and caves will be used communally or constructed in a group. A typical year consists of hibernation during the winter; feeding, courting, and mating in the spring; feeding and courting in the summer; and mating and hibernation in the fall (Berry 2008, USFWS 2008a). Juveniles are typically active during more of the year than adults, as their smaller mass allows them to respond faster to temperature changes.

Desert tortoises emerge from hibernation and begin the reproductive process in March and April. Nests are often constructed at the opening or just inside of burrows. If conditions are unfavorable for egg-laying, females may carry sperm in the albumen gland in their oviducts for two to three years, and sometimes for as long as 15 years. Eggs are usually laid between May and July in clutches of 1 to 12 eggs. In the Mojave Desert population, tortoises will typically lay two or occasionally three clutches per year, although this is dependent on that year's plant production, which is dependent upon annual rainfall quantities. Eggs take between 70 and 120 days to hatch, during which time they are subject to predation from coyotes and kit foxes (Berry 2008). Once hatched, hatchlings are at the risk of being preyed upon by ravens, coyotes, and other predators. Desert tortoises reach sexual maturity between 12 to 25 years of age, or at around 180 mm (Berry 2008).

Desert tortoises will typically forage on winter and summer annuals, herbaceous perennials, succulents, and grasses, usually found in intershrub spaces, washes, and washlets. Preferred vegetation includes lupines, lotuses, vetches, evening primroses, and other native plants. Newly hatched tortoises will feed upon their yolk plug—emerging from the plastron—for about the first month, after which they will seek out small native plants such as *Camissonia, Plantago, Euphorbia, Lotus, Astragalus*, and *Cryptantha* (Berry 2008).

Survey Results

This species and its sign were identified during the desert habitat assessment conducted in 2008. One individual was identified in a burrow located along Segment A. Several other tortoise occurrences—live and dead—have been reported to the CNDDB within the Project's vicinity (CDFG 2011a).

Distribution and Occurrence in Project Area

The Mojave population of the desert tortoise is present north and west of the Colorado River in the Mojave Desert in California, Nevada, Arizona, and southwestern Utah. They are also present in the Sonoran Desert in California (USFWS 2008a). Desert tortoises and their sign have been observed in the

Mojave Desert within the upper limits of the Project area during field surveys conducted in 2008 (POWER 2010).

6.4 AMPHIBIANS

6.4.1 California Red-legged Frog

Regulatory Status

The California red-legged frog (*Rana draytonii*) is a federal Threatened species and a California Department of Fish and Game Species of Special Concern (CDFG 2011c). It was listed as Threatened by USFWS in 1996 (61 FR 25813 25833).

Critical Habitat

Designated critical habitat Unit LOS-1 (San Francisquito Creek) for the California red-legged frog is located within San Francisquito Canyon and comprises 4,231 acres (75 FR 12815 12959). The Project action area does not overlap this critical habitat unit and although Forest Road 5N27 would potentially provide access for construction vehicles during construction, it will not be used because it crosses San Francisquito Creek within critical habitat. The boundaries of Unit LOS-1 extend to within 0.20 mile from the proposed new 230 kV centerline.

Life History and Habitat Requirements

California red-legged frogs may depend on multiple habitat types over the course of a single year or may be confined to one distinct area. In general, their breeding habitat is characterized by deep, still, or slow-moving water, usually permanent, that typically has dense emergent vegetation, although this is not a requirement (USFWS 2002b, Stebbins 2003). While ponds are used most often for breeding habitat, ponded areas of streams, marshes, lagoons, reservoirs, and other still or slow-moving water bodies may also be used (USFWS 2002b, Stebbins 2003, Elliott et al. 2009, Amphibiaweb 2011). Water is usually around two feet in depth to be appropriate for breeding, but tadpoles have been observed in water that was less than one foot deep. Associated vegetation commonly includes cattails (*Typha* sp.), rushes (*Scirpus* sp.), or willows (Jennings and Hayes 1994, Stebbins 2003, Amphibiaweb 2011).

California red-legged frogs breed approximately between November and April, often for a period of only one to two weeks (USFWS 2002b, Stebbins 2003, Elliott et al. 2009). Calling sites may be in different locations than breeding sites, where eggs will be laid in large clusters (3 to 12 inches in diameter) of up to 6,000 eggs (Stebbins 2003). These eggs masses will typically be attached to surrounding emergent vegetation, but will still float on the water's surface (USFWS 2002b, Amphibiaweb 2011). California red-legged frogs typically lay eggs in March, with eggs hatching within 6 to 14 days depending on temperature, and tadpoles developing into frogs in another 11 to 20 weeks (Jennings and Hayes 1994, USFWS 2002b). Some tadpoles may overwinter, however, and take two breeding seasons to fully develop into frogs (USFWS 2002b, Fellers et al. 2001, Amphibiaweb 2011). Water salinity must be less than 4.5% for eggs and tadpoles to survive (Jennings and Hayes 1994). Juvenile California red-legged frogs are active both diurnally and nocturnally, while adult frogs are mostly nocturnal. Research has suggested that individuals in coastal populations may remain perennially active, whereas those in inland populations may become dormant during low temperature extremes.

During particularly wet seasons, California red-legged frogs have been known to migrate up to two miles from breeding sites, temporarily residing in other parts of a stream or in upland habitat. Research has shown that, when migrating, individuals apparently do not consider vegetation or topography to be limiting factors in their migration routes and will consequently typically migrate more or less in straight lines rather than remaining confined to riparian corridors (Bulger et al. 2003, Rathbun and Scott 2010). California red-legged frogs may inhabit various habitat types during dry periods when water may not be available. These can include spaces under rocks or logs, areas within industrial debris, agricultural areas, or deep cracks within dried ponds, as long as the area is able to remain cool and moist until the frog can migrate back to pond habitat (USFWS 2002b, Amphibiaweb 2011). These areas are typically much closer to potential water sources.

Survey Results

This species was not identified during surveys conducted within the Project area in 2008 and 2009. However, it is known to be present in what is known as the (St. Francis) "Dam Reach" of San Francisquito Creek and has been identified in San Francisquito Creek by USGS every year, inclusive from 2001 to 2010, with the exception of 2006 (USGS 2002, USGS 2003, USGS 2004, USGS 2005a, USGS 2005b, USGS 2007, USGS 2008, USGS 2010, USGS 2011). The Dam Reach begins at the foundation of the broken Saint Francis dam and extends downstream for approximately 500 meters. Suitable habitat was identified at several locations within the ROW.

Distribution and Occurrence in Project Area

California red-legged frog was historically present throughout 46 counties in California, but is now extirpated from approximately half of those, including most of its historic Southern California range (USFWS 2002b). Additionally, there are areas within the proposed transmission line corridor which contain suitable habitat for this species. However, while LOS-1 is occupied by a breeding population of California red-legged frogs, the steep slopes separating LOS-1 from the proposed transmission line ROW are expected to make migration more difficult between the areas, but not completely impossible due to the various drainages and tributaries which connect them. California red-legged frog is expected to have a possibility of occurring within the Project area.

6.4.2 Arroyo Toad

Regulatory Status

The arroyo toad (*Anaxyrus californicus*) is federally listed as endangered and is a California Department of Fish and Game Species of Special Concern (CDFG 2011c). When the arroyo toad was first listed by USFWS in 1994 (59 FR 64859 64867), it was considered a sub-species of the southwestern toad (*Bufo microscaphus*) but later was elevated taxonomically to the status of species with a different scientific name (*Bufo californicus*; Gergus 1998). It has recently been named into the genus *Anaxyrus* (Frost et al. 2008), but this change does not alter the description or distribution of the animals.

Critical Habitat

The Project does not occur within designated critical habitat for arroyo toad. Revised critical habitat for the arroyo toad was designated on February 9, 2011 (76 FR 7245 7467) and the closest critical habitat unit, Castaic Creek, is not within the Project area.

Life History and Habitat Requirements

The arroyo toad has the most restricted habitat requirements of any anuran species in California (Stebbins 2003). It breeds in stream channels with broad open sandy areas, and burrows in sandy or loamy soils on adjacent stream terraces (USFWS 1999, Stebbins 2003). Arroyo toad breeding sites do not have a closed canopy of vegetation, and tend to be associated with banks of willow (*Salix* sp.) and mulefat scrub (Ramirez 2007). Water in breeding sites is slow-flowing and very shallow, generally in the main stream channel or nearby channels. Breeding sites are typically free of vegetation and frequently have sandy terraces located along the stream edge.

While northern populations of arroyo toads have been observed to begin breeding around March, southern populations may begin breeding as early as January (USFWS 1999). At higher elevations (up to 4,000 feet), arroyo toads have been observed to breed during May and June (Ramirez 2007). Males will typically call from one to two meters from the shoreline of pooled water, two to four centimeters deep, and wait for the female to approach (AmphibiaWeb 2011). Eggs are deposited in two simultaneous strands at the calling site in water typically around nine centimeters deep with insubstantial current and minimal vegetation. One study found the average clutch size to contain 4,714 eggs, which subsequently requires four to six days to hatch in water with a temperate of 12 to 16 degrees Celsius. It will typically take another 65 days at minimum for larvae to metamorphose. They will remain near their natal pool for three to five weeks until the area begins to dry up and/or they reach an adequate size, typically around 30 mm snout-vent length.

When not breeding, the arroyo toad disperses into upland habitat, especially in coastal areas. Based on limited information from a pit fall study at Camp Pendleton, arroyo toads have been observed to move up to about one kilometer from breeding sites into upland habitats (Holland and Sisk 2001). However, radio-telemetry studies show them generally moving shorter distances, up to several hundred meters away from stream channels (Ramirez 2007). Activity is highest in late winter and early spring, following the rainy season.

Arroyo toad upland habitat is characterized by coastal sage scrub, chaparral, grassland, or oak woodland (USFWS 1999). In upland areas (such as those of the Project), during the non-breeding season, the arroyo toad often burrows and aestivates directly within the stream channel (Ramirez 2007). This burrowing in the stream channel is probably due to the dry habitat of the upland areas, and the species' need for some soil moisture during aestivation.

Survey Results

This species was not identified during surveys conducted within the Project area in 2008, 2009, and 2010. However, it is known to be present in a breeding metapopulation within Castaic Creek, which is located downslope from the terminus of the new 230 kV circuit, on the opposite end of Castaic Power Plant. Arroyo toads were identified at this location during a June 2008 field training session, which included diurnal and nocturnal surveys. Suitable habitat was identified within the ROW in several locations.

Distribution and Occurrence in Project Area

The arroyo toad's range extends from the Salinas River Basin in Monterey and San Luis Obispo Counties to Arroyo San Simón in northern Baja California. It occurs in semi-arid regions near washes or intermittent streams, including valley foothill and desert riparian wash. Its microhabitat is in riparian habitat of surface water with sandy banks, willows, cottonwoods, and sycamores, or loose, gravelly areas of streams in the drier parts of its range. Arroyo toads are known to be present in a breeding population within Castaic Creek, north of the Castaic Power Plant. However, the proposed upgrade of the existing line would not impact the Castaic Creek population, as the existing line is south of the Castaic Power Plant (See Figure 1). They are not known to be present within or around the area encompassing the proposed new 230 kV circuit transmission line, although some potential habitat is present along the portion of the route that would cross the ANF on the Proposed Action. Although this species is not known to reside in this area outside of Castaic Creek, it has the potential to occur along the Proposed Action based on availability of suitable habitat.

6.5 FISH

6.5.1 Unarmored Threespine Stickleback

Regulatory Status

The unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) was federally listed as endangered in 1970 (35 FR 16047) primarily due to competition with or predation by non-native fish, loss of habitat through urbanization and channelization, and introgression with other subspecies of unarmored threespine sticklebacks. The recovery plan for the unarmored threespine stickleback (USFWS 1985) provides additional information on the biology of the species, reasons for its decline, areas of essential habitat, and the actions needed for recovery of the species. The unarmored threespine stickleback is a fully protected species under California law (California Fish and Game Code, Section 5515 (b) (9)).

Critical Habitat

There is no designated critical habitat for the unarmored threespine stickleback. Critical habitat was proposed in 1970 within San Francisquito Canyon but was never finalized (45 FR 76012 76015).

Life History and Habitat Requirements

Unarmored threespine stickleback is not a strong swimmer and prefers quiet water, such as pools with abundant aquatic vegetation, backwaters, and stream channel margins where water velocity is low (Moyle et al. 1995). They are found in low-gradient streams with moderate- to low-flow rates, although the streams can experience flashy, high-flow events (Baskin 1974). They prefer water temperatures cooler than 75° F (24° C). Threespine sticklebacks are visual feeders and require clear water to facilitate feeding on benthic organisms or those that live on aquatic plants; they cannot maintain populations in turbid waters (Moyle 2002).

Specific environmental conditions that contribute to high-quality habitat for unarmored threespine stickleback include abundant pools that are twice the average stream depth and width, sand and loam substrate with small gravel, embankments rich in vegetation, moderate density of aquatic algae, and moving water with a velocity less than 0.33 feet/second (0.1 meter/second). Important habitat components include: (1) sufficient depth or flow of water to prevent anoxic conditions in late summer; (2) aquatic vegetation for protection and to provide nesting material for males; and (3) small invertebrates to provide forage (Malcolm 1992).

Unarmored three-spine sticklebacks reproduce throughout the year with a minimum of breeding activity occurring from October to January. Reproduction occurs in areas with adequate aquatic vegetation and gentle flow of water where males establish and vigorously defend territories. Unarmored threespine sticklebacks are believed to live for only one year (USFWS 1985). Schooling behavior improves feeding efficiency and is common among sticklebacks, except when breeding (Moyle 2002).

Survey Results

This species was observed in San Francisquito Creek in 2001 (USGS 2002), 2002 (USGS 2003), 2003 (USGS 2004), 2004 (USGS 2005a), and 2005 (USGS 2005b) by USGS. It is believed that this population has since been extirpated in San Francisquito Canyon following the Copper Fire in 2002 and heavy flooding in 2005 (75 FR 28636 28642, CDFG 2011a).

Distribution and Occurrence in Project Area

The unarmored threespine stickleback (UTS) is present within the upper Santa Clara River and its tributaries in Los Angeles County, San Antonio Creek on Vandenberg Air Force Base in Santa Barbara County, and around Shay Creek in San Bernardino County (75 FR 28636 28642).

In 2001, the U.S. Geological Survey (USGS) began conducting UTS surveys in two stretches of San Francisquito Creek referred to as the "Dam Reach" and the "Drinkwater Reach." The USGS annually monitored and observed UTS in the Dam Reach from 2001 to 2005. This population has since been extirpated in San Francisquito Canyon following the Copper Fire in 2002 and heavy flooding in 2005 (USFWS 2009c, CDFG 2011a).

The Drinkwater Reach begins at the outfall of the Drinkwater reservoir where it enters San Francisquito Canyon and can extend downstream from as little as 130 meters to approximately 2 kilometers depending on outfall rates from the reservoir and current weather conditions. USGS also identified an additional wetted portion within San Francisquito Canyon that did not contain UTS but provided suitable habitat for the species that begins near the LADWP Power Plant 1 in Clearwater Canyon and extends for one kilometer up and downstream from the confluence with Clearwater Canyon.

UTS is not expected to occur within the Project area because of the aftermath of the 2002 Copper Fire and 2005 heavy floods in this area. The last known observation of UTS in San Francisquito Creek was in 2006 by the USGS (USFWS 2009c).

7.0 EFFECTS OF THE PROJECT

In this section, the construction, operation, and maintenance for the construction of the proposed BRRTP are evaluated to determine if federally listed threatened or endangered species within the action area could potentially be affected. Potential effects include temporary disturbance and displacement, loss and fragmentation of habitat, and take of individual animal species. Effects are anticipated to result in both direct and indirect impacts. Direct impacts are those which cause immediate responses such as mortality, habitat loss, and disturbance that may result in behavioral changes, such as flushing and displacement. Indirect impacts are those which cause a protracted response such as increased foraging time or increased roost tree searching due to habitat reduction and/or habitat degradation.

7.1 EFFECTS ANALYSIS

7.1.1 Plants

Mitigation Measures for Effects to Listed Plant Species

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require the authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-13 Protect special-status plant species and their habitat. This mitigation measure would require LADWP to conduct pre-construction surveys for special-status plant species in the Project vicinity; to flag and avoid all identified individuals; and to restore/compensate for all special-status plants impacted by Project construction. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Listed Plant Species

New 230 kV Transmission Line – Construction of the proposed new 230 kV transmission line could potentially directly affect federally listed botanical species that could occur within the transmission line corridor, including Braunton's milk-vetch, Nevin's barberry, San Fernando Valley spineflower, and slender-horned spineflower. Thread-leaved brodiaea, California orcutt grass, and spreading navarretia are not expected to be present within the Project area due to lack of suitable habitat and will not be discussed further within this analysis. Direct impacts that could occur include habitat loss or loss of individual plants. Project construction may remove habitat which is suitable to support one or more of these species. Additionally, individual plants may be removed during excavation or ground-disturbing activities, or lost due to foot or vehicular traffic. Ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. Helicopter construction may also carry or blow seeds between sites and potentially introduce non-native seeds. The impacts listed above could be localized and temporary or more permanent if habitat is greatly altered and seed sources are removed. However, preconstruction surveys, timing limitations, and avoidance mitigation, as described above, will be implemented to reduce impacts to botanical species.

Many of the potential indirect effects can be categorized as habitat degradation, which could occur through proliferation of non-native plant species, spread of dust onto vegetation within or adjacent to work areas, and soil compaction, all of which may affect the ability of native plants to survive or occur within affected areas. Non-native weed seeds may attach to vehicle tires, undercarriages, or elsewhere and can be quickly and easily transported between work areas, where they may fall onto disturbed ground and potentially out-compete native species if they become established. Because of this ease of transportation, roadsides are often easy for invasive plants to spread into, which also increases the likelihood of seeds becoming attached to passing vehicles and being transported elsewhere. The risk of introducing invasive plants can be reduced by thoroughly cleaning construction or maintenance vehicles before moving to a new site and minimizing the area affected by vehicular traffic. Herbicidal, manual, or mechanical methods may also be used to control exotic weed species. Construction can also result in the generation of dust due to helicopter construction and ground disturbance, excavation, or even vehicular traffic. Dust that settles onto adjacent vegetation may reduce a plant's vigor by affecting its photosynthetic effectiveness. LADWP would be required to prepare and implement a Fugitive Dust Emission Control Plan in order to reduce the proliferation of dust throughout the Project area. Trampling due to foot or vehicular traffic could result in soil compaction if it occurs repeatedly within any specific area; soil compaction may in turn lead to reduced water absorption and increased runoff, potentially contributing to an increase in non-native plant species, which could be more tolerant of these conditions. All of these soil compaction effects may lead to plant death or reduced reproduction/health. Any listed plants discovered in the Project area disturbance sites will be first avoided and marked by flagging with buffers designed to reduce any effects of soil compaction. If avoidance is deemed to not be possible, the USFWS would be consulted for authorization and consequential mitigation measures.

Reconductoring – The proposed upgrade of the existing BR-RIN would involve approximately 13 miles of NFS lands and four miles of BLM-managed public lands. Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G (proposed route for the Proposed Action's new 230 kV transmission line) are analyzed in detail above for botanical species impacts in the preceding section. The reconductoring component would continue south beyond the terminus of the new 230 kV transmission line at the proposed Haskell Canyon Switching Station, along the alignment designated as Segment K, which is analyzed below.

Segment K was not surveyed for botanical species but was instead reviewed for plant occurrences and potentials to occur based on known habitat and records along the existing transmission line. As a result there may be protected species in the vicinity of the existing ROW that were not previously known to be present. Preconstruction surveys should locate most of these plants so that they can be avoided, but in the event that a plant goes unseen or if construction occurs during a time when plants are not flowering and are not distinguishable, destruction of the plant by grading or excavation is a possibility. Trampling by ground crews would likely not kill any plants, but may partially destroy their above-ground biomass. Any listed plant species that are detected during preconstruction surveys would be flagged and protected with an exclusion buffer if possible; LADWP would consult with USFWS regarding any listed plant species that cannot be protected on private lands. Clearing and grading associated with construction on towers or the grading of access or spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. LADWP would be required to restore areas to a suitable condition as determined by the landowner or land management agency; in this case this may include measures such as re-establishing contours, reseeding bare or disturbed areas, and installing cross drains for erosion control. Indirect effects include spread of non-native plant species, soil compaction, and increased dust deposition as previously discussed above. There is potential for construction activities to introduce noxious or invasive plant species to the existing habitats. Vehicles moved from one construction site to the next sometimes introduce non-native or invasive plants by transporting seeds that may be clinging to vehicle structures or that have been incorporated into soil adhering to the vehicle. In addition, the potential for establishment of invasive plants can be increased when construction vehicles alter the structure of existing soils through compaction, which alters the ability of native plants to compete with introduced plant species. Mitigation to reduce these effects is described above. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions. Where applicable, erosion control methods would be implemented to avoid downslope sediment movements. In addition, construction may be conducted by helicopters to reduce the disturbance footprint on steep slopes.

New 230 kV Circuit – During the 2008, 2009 and 2010 botanical surveys, no threatened, endangered, or candidate species were observed along the proposed new 230 kV circuit Project component. However, botanical surveys were not completed on much of this alignment, as it was covered in dense chaparral. Preconstruction surveys should locate most of these plants so that they can be avoided, but in the event that a plant goes unseen or if construction occurs during a time when plants are not flowering and are not distinguishable, destruction of the plant by grading or excavation is a possibility.

Potential direct effects include vegetation loss and partial or complete destruction of special-status plant species that may be present within the ROW. Trampling by ground crews would likely not kill any plants, but may partially destroy their above-ground biomass. Indirect effects include spread of non-native plant species, soil compaction, and increased dust deposition. Mitigation to be implemented is discussed for each of these direct and indirect effects above.

Barren Ridge Switching Station Expansion – Proposed substation upgrades would require an additional 235 feet by 500 feet (2.7 acres). The Barren Ridge Switching Station is not within potential habitat for the botanical species listed above, nor are there any documented occurrences within the confines of the switching station. A habitat assessment was conducted in 2008 that documented the current vegetation community (POWER 2010). The Barren Ridge Switching Station would result in no effect to botanical species.

New Haskell Canyon Switching Station – Construction of Haskell Canyon Switching Station could potentially directly affect federally listed botanical species which could occur within the proposed Haskell Canyon Switching Station footprint, including Braunton's milk-vetch, Nevin's barberry, San Fernando Valley spineflower, and slender-horned spineflower. Direct impacts that could occur include habitat loss or loss of individual plants. Individual plants may be removed during excavation or ground-disturbing activities, or lost due to foot or vehicular traffic. Ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. Soil compaction from construction or excessive vehicular passage can result in plants being unable to receive sufficient water and nutrients through the soil to their roots. This could result in a loss of vigor and vitality to any plant that is present within soil that has been compacted. Additionally, soil compaction can result in increased runoff due to decreased water absorption in the soil. During construction, dust deposition from passing vehicles or from construction in dry dirt has the potential to result in decreased plant vigor due to reduced photosynthetic capabilities from a dust layer. These impacts would be localized and temporary. Furthermore, preconstruction surveys, timing limitations, and avoidance mitigation, as described above, would further reduce impacts to botanical species.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and switching stations would pose a threat to botanical species. Temporary increased ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. Additionally, individual plants may be removed during ground-disturbing activities or lost due to foot or vehicle traffic.

Repeated maintenance activities may have some effect on vegetation type conversions in or around the Project area. It is unlikely that vegetation clearance beneath transmission towers—conducted to reduce wildfire risks—would lead to substantial changes in vegetation types. In many cases, towers are completely bare and devoid of vegetation underneath; in situations where vegetation is permitted to grow underneath, it is typically kept at levels low enough to avoid overgrowth. Any non-native species growing beneath a given tower would be cut down along with any native species that is present. However, tree trimming related to power line safety, in which trees that are at risk of hitting the conductors are trimmed, may lead to some vegetation type conversion. This would occur in situations where canopy trimming is substantial enough to cause sunlight to hit individual plants that may normally be accustomed to reduced amounts of direct sunlight. Such instances would favor plants—native or non-native—that are more tolerant of sunlight, are more drought tolerant, or have been stunted by a relative lack of exposure due to previous high canopy cover. This may lead to vegetation type conversions in particular areas along the ROW; however, unless plants are highly competitive, this is unlikely to adversely affect areas outside of the ROW.

Transmission line ROWs may further lead to the propagation of non-native weed species or to illegal recreation activities. Because ROWs are often dirt roads either bordered by vegetation or with vegetation growing directly on them, it is very easy for vehicles to pick up seeds—native or non-native—and carry them outside of the local area and farther along the ROW or to other areas outside of the ROW. This happens when seeds become attached to vehicle tires, undercarriages, or elsewhere and subsequently are carried out of the area. Additionally, ground disturbance related to maintenance activities may remove native species from a particular area and make it easier for non-natives to grow and establish afterward.

This is also a problem following wildfires; while some native species will grow in greater abundance following fires, reduced competition may also increase the opportunities for non-native species to establish and propagate. Similar effects would be expected from the use of illegal OHVs along ROWs or other trails or open areas adjacent to ROWs. Because ROWs are usually maintained to be drivable at least for high-clearance vehicles, they are often attractive routes for OHVs and motorbikes, which can gain access onto them and potentially increase the risk of damage to the surrounding habitat.

Herbicide Application – The herbicides listed below in Table 8 are to be used for the eradication of non-native invasive plant species in the disturbance areas of the Project before, during and after BRRTP's construction. The most common herbicide to be utilized on the Project will be glyphosate, on annual or short lived perennial plant species. Triclopyr will be the most common herbicide used on long-lived perennials, which will be less abundant than annuals in the restoration sites. Herbicide application techniques and rates will depend on the species of plants present and the presence of any adjacent sensitive areas (e.g., streambeds) or proximity of sensitive plant or animal species. For a more in-depth discussion of potential non-native plant treatment by herbicide, please refer to the BRRTP Weed Risk Assessment (POWER 2011). In addition, mitigation measures to ensure minimal impacts from herbicide use are explained below.

As part of a comprehensive Weed Control Program (BIO-2 [prevent the spread of invasive weeds]), several options may be utilized to limit or reduce impacts from invasive plants. To date, several methods exist and are regularly prescribed for the eradication of existing weed populations depending on their location and the habitat type they infest. Some of these include herbicide application, mechanical removal, biocontrol methods, prescribed burns or floods, and shading. The removal of established noxious weed populations is best accomplished by species-specific methodologies, which may include a combination of the above removal procedures or precise timing of specific actions. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a differing follow-up treatment method after the initial removal occurs.

Noxious weed control measures prescribed as mitigation for Project impacts should be species-specific, and herbicides should be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for that weed species. While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and ingestion of contaminated media, including vegetation, prey species, and water. However, with the measures prescribed as mitigation, the potential for impacts to aquatic fauna would be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Off-site drift typically depends on the droplet size and meteorological conditions. Other off-site exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion.

Table 8 contains a list of herbicides, including their potential risks to native vegetation and wildlife, which are proposed for use within the Project area. It is important to note that there is an extensive variability related to different types of exposure scenarios and dosages for each herbicide. Furthermore, the effects of certain herbicides can vary exclusively at the species level. Therefore, the information presented in Table 8 is intended as a general overview of the possible effects of herbicide use for NSF lands. Full analyses on the effects of these eight listed herbicides on human and ecological health can be found in the Forest Service Risk Assessment Final Reports (USFS n.d.), which are incorporated here by reference.

TABLE 8. GENERAL EFFECTS OF HERBICIDES ON PLANT AND WILDLIFE SPECIES

HERBICIDE	EFFECTS ON VEGETATION	EFFECTS ON WILDLIFE
Chlorsulfuron	• Rate and extent of uptake following foliar application varies by species • Inhibits an enzyme that is essential for plant growth	• Causes weight loss and decreased body weight gain in experimental mammals • Appears to have low toxicity in mammals, birds, fish, and invertebrates
Clopyralid	• Highly selective toxicity to terrestrial plants (primarily broadleaf species) • Relatively non-toxic to aquatic plants and grasses • Regulates plant growth by acting as a synthetic auxin, thus altering plant's metabolism and growth characteristics	• Appears to be relatively non-toxic to terrestrial or aquatic wildlife • May adversely affect liver and kidney weights and gastric epithelial tissue • Appears to show no effect on viability of bird eggs and chick immune systems
Dicamba	• Mimics plant hormone indole-3 acetic acid • Mechanism appears to involve a stimulation of ethylene production leading to accumulation of abscisic acid and/or cyanide resulting in abnormal growth	• Displays an apparent pattern of interspecies scaling, with smaller animals being less sensitive than larger animals • Relatively non-toxic to mammals, fish, and amphibians • Acute toxicity to birds appears to be generally low • May reduce growth and stunt eye development in pre- and post-hatch birds • Likely to have adverse effects to animal reproduction at regular rates of application, and expected to have adverse reproduction effects at high rates of application
Glyphosate	• Inhibits shikimic acid pathway, effectively blocking synthesis of certain phenolic compounds and aromatic amino acids • Inhibits photosynthesis, respiration, and nucleic acid synthesis	• May reduce food conversion efficiency leading to loss of body weight in mammals and birds, but no likely risk of other effects at regular rates of application • Certain surfactants used with glyphosate are much more toxic to fish than others • May cause histological changes in gills, kidneys, and liver of some fish • High rates of application may have effects on large herbivores or insectivorous birds • Available data suggests that the risks to terrestrial-phase amphibians may be similar as that to birds and toxicity to aquatic-phase amphibians may be similar as that to fish
Hexazinone	• Inhibits photosynthesis by diverting highly reactive molecules into a chain reaction that destroys chloroplast, cell membranes, and other vital compounds that eventually leads to cell death and ultimately plant destruction • Can be used as a pre or post emergent herbicide	• Relatively low toxicity to birds and mammals. • May cause decreased food consumption and/or decreased food conversion efficiency in mammals, potentially leading to weight loss • Slightly toxic to most aquatic animals, including fish, but can be highly toxic to algae and aquatic macrophytes • Potential to build up in soil and plant matter and move through food chain if used at very high rates
Imazapyr	• Inhibits an enzyme that is essential for plant growth • Practically non-toxic to conifers	• Appears to be relatively non-toxic to terrestrial and aquatic animals
Sulfometuron methyl	• Blocks cell division in the active growing region of the stem and root tips • Can be used as a pre or post emergent	• Practically non-toxic to birds • Slightly toxic to fish, mostly in the hatch stage • Slightly toxic to mammals, but no birth defects or cancer • Little data available on toxicity to invertebrates but appears to have limited toxicity • Data shows effects on limb development , organogenesis, and metamorphosis
Triclopyr	• Mimics indole auxin plant growth hormones causing uncontrollable growth • At sufficiently high levels of exposure, abnormal growth is so severe that vital functions cannot be maintained and plants die	• May cause developmental effects at levels that cause maternal toxicity in mammals • May have adverse affect on mammalian kidney functions • May have adverse reproductive effects to herbivorous and insectivorous mammals at high rates of application • Higher concentrations may cause mortality or immobility in frog tadpoles • Larger doses may cause a decrease in body length and smaller doses may lead to lethargic behavior in some fish • Relatively non-toxic to birds • Studies suggest relatively low toxicity to invertebrates

Sources: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml
http://www.ruraltech.org/video/2006/invasive_plants/pdfs/Douglas_Hall/10_bautista.pdf

The use of herbicides in the Project area would comply with regulations set forth by the EPA and the California Department of Pesticide Regulation (CDPR). Additionally, any herbicide use on NFS lands would be subjected to the review and approval of the appropriate USFS personnel. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect.

The following mitigation measures will be followed in order to minimize the detrimental effects of herbicides to native and special status vegetation and wildlife:

- Herbicides shall be used with the least toxic surfactant available.
- Herbicides shall not be applied during or within 24 hours of a 70% chance of occurring rain event.
- Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used.
- Herbicides shall not be applied by spray equipment when wind velocities exceed six mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied over 15 mph.
- In areas containing special status plants or animals, there will be a five- to 70-foot buffer (size of buffer will be determined and flagged for avoidance by an authorized botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of species, vulnerability of herbicide being used, concentration of herbicide used based on no observed effect concentrations (NOEC) and/or environmental conditions and terrain) where herbicides are not used.
- Where herbicide control methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds.
- Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by a USFS botanist.

Restoration Activities (e.g., seed collection, weed removal) – Restoration activities may inadvertently lead to negative effects on listed species such as those described in this document. For instance, seed collection from native plants may result in the unintentional trampling of smaller listed species should they be present in the area, or in the inadvertent removal or destruction of their seeds. Weed removal activities may lead to species being treated or removed that are not non-native. However, it is unlikely that listed species, as well as native plants in general, will be present in areas of heavy non-native plant cover and may instead be present in areas of predominantly native or mixed native/non-native plant composition. In addition, weeding and seed collection efforts may lead to the unintentional transportation of non-native seed on clothing or weeding materials to areas occupied by listed plants, potentially creating a new weed infestation. In order to minimize the negative impacts of these restoration activities mitigation measures such as effective preconstruction flagging of sensitive species, required training for field personnel to be familiar with identifying non-native species and/or species that are to be avoided, and washing seeds off of all equipment prior to entering new areas would assist in reducing the likelihood of incidental effects during seed collection or weed removal.

Summary – Braunton's milk-vetch, Nevin's barberry, San Fernando Valley spineflower, and slender-horned spineflower may potentially occur within the Project area. Project construction may result in habitat loss and degradation for all of these species if they are found within the Project area, although direct mortality or effects to individual plants would be dependent on their presence within work areas and their successful avoidance due to preconstruction surveys and flagging. General practices that would reduce short-term or long-term effects to special-status plant species or their habitat include GP-24, GP-25, GP-33, GP-35, GP-36, GP-41, GP-42, GP-43, GP-44, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to special-status plant species or their habitat include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and protection measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), and BIO-6 (Implement a Worker Environmental Awareness Program).

Effects Determination

The Proposed Action **may affect, but is not likely to adversely affect** Braunton's milk-vetch, Nevin's barberry, San Fernando Valley spineflower, and slender-horned spineflower.

7.1.2 Birds

California Condor

Mitigation Measures for Effects to California Condor

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-7 Impacts to Raptors. This mitigation measure would require LADWP to conduct pre-construction surveys for raptor nests in the Project vicinity; avoid active nests during nesting season where possible; and to consult with BLM, CDFG, USFS, and/or USFWS as applicable where active nest avoidance is infeasible or where inactive nests will be removed. (Refer to Table 5 for the full text of this mitigation measure)

BIO-11 Reduce avian collisions with and electrocutions on transmission lines. This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 5 for the full text of this mitigation measure)

BIO-18 Protect California condor. This mitigation measure would require LADWP to retain a qualified biological monitor during construction; to halt construction during specified hours when condors are identified near construction and consult with USFWS (and USFS if on NFS lands); to dispose of all microtrash; to distribute a California condor education flier to all construction personnel; and to report all condor sightings to USFWS (and USFS if on NFS lands). (Refer to Table 5 for the full text of this mitigation measure)

Effects to California Condor

New 230 kV Transmission Line – This species is expected to be present within the ANF based on GPS data supplied by USFWS (USFWS 2008, USFWS 2009a). Piru Reservoir, which is approximately 13 miles from the new 230 kV transmission line, is a known feeding ground. Although condors are not known to regularly visit any site within the Proposed Action, they do occur over the action area during foraging trips. There are no known condor roost sites that would be affected by the proposed transmission line. Construction for the Project could cause short-term temporary behavioral avoidance of the area due to increased activity or noise. Condors are known to become alarmed by loud noises from distances of over one mile, and may avoid coming close to or nesting near these areas or may alter their behavior to avoid the activity (USFWS 1996). However, Project construction should not involve overly excessive noises such as blasting, and LADWP would enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. The California condor can be expected to frequent the Project area, particularly as they pass over on the way to feeding ground near Piru Reservoir. The threshold for noise disturbance has not been established for the condor, making effects of noise from the new transmission line (i.e., corona noise) difficult to predict.

The construction of the transmission line would result in an increase of human presence in the Project vicinity. Tower construction and grading of new or existing access roads will result in habitat and vegetation loss. There is a short-term impact that could result from microtrash, which has the possibility to be ingested by condors and which could in turn be regurgitated for chicks to feed on, which can lead to mortality of the chicks (USFS 2008). However, mitigation measures have been designed to develop a Proper Disposal of Construction Waste Plan for the Project, which would address the disposal of microtrash. As stated in mitigation measure BIO-6 (Implement a Worker Environmental Awareness Program), road kill within the construction area would be reported within 24 hours to the USFS or BLM if on USFS or BLM land, respectively, or to the local animal control center if on non-federal lands. The additional traffic and human presence from Project construction is not expected to adversely affect condors due to its localized nature relative to the expansive foraging range of condors—over 140 miles for immature and typically 31 – 44 miles for nesting pairs in a single day (USFWS 1996)—combined with the general lack of occurrence data in the vicinity of the new 230 kV transmission line. Short-term direct impacts to condors' nests would be limited because no nests have been observed (USFWS 2009a), curtailing the possibility of abandonment from disturbance.

No California condor critical habitat would be affected. The significance of behavioral avoidance by condors in the long-term (if it occurs) would be considered minor because multiple routes to and from principal feeding grounds of the condor would be maintained. If condors are present in the vicinity of the Project, they may be at risk for collision. While the transmission lines and towers would be constructed according to APLIC guidelines (2006), reducing the chance for electrocution, in certain isolated areas, such as where transmission lines span across canyons or are located along ridgelines, there would be greater risks for condor collisions. As condors continue to expand their current range into their historical distribution, this risk could increase in mountainous areas where condors are more likely to occur.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K (Figure 1). Segments A, B, and G are analyzed in detail for the California condor impacts in the preceding section. The additional potential impacts resulting along Segment K are described below.

Construction of the Project may result in a negligible reduction of available foraging habitat, but because condors may fly over 140 miles away to forage, it is not expected that construction impacts on habitat would substantially affect condor foraging or considerably reduce the amount of foraging habitat available. Most condor activity is concentrated south, southwest, and northwest of the Project area, according to data supplied by USFWS (USFWS 2009a).

New 230 kV Circuit – The California condor is known to occur within this area, and would therefore be vulnerable to short-term impacts such as microtrash, which has the possibility to be ingested by condors and which could in turn be regurgitated for chicks to feed on, which can lead to mortality of the chicks (USFS 2008). These impacts would be localized and temporary. Protection measures such as BIO-18 (Protect California condor) would be developed that would address the disposal of microtrash, including specialized microtrash removal training for workers and daily trash removal. As stated in mitigation measure BIO-6 (Implement a Worker Environmental Awareness Program), roadkill within the construction area would be reported within 24 hours to the USFS or BLM if on USFS or BLM land, respectively, or to the local animal control center if on non-federal lands. Because there have been more condor records in the vicinity of the new 230 kV circuit, the potential for a condor to occur within this area of the Project during construction may be slightly greater. However, the additional traffic and human presence from Project construction is not expected to adversely affect condors due to its localized nature relative to the expansive foraging range of condors. The new 230 kV circuit would result in no effect to the California condor.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known habitat or occurrences have been documented for the California condor; therefore, no impacts to this species are anticipated from this Project component.

New Haskell Canyon Switching Station – The Haskell Canyon Switching Station would be located less than 0.5 mile from heavily populated residential areas in Santa Clarita, but would occur just outside the boundaries of the ANF and may still be within areas considered to be suitable for foraging by this species. It is estimated that a maximum of 13.7 acres would be permanently lost as a result of the switching station, parking lot, access roads, and other disturbance associated with the construction and operation of this switching station (Table 9). This would reduce potential foraging habitat in this area, but would not likely restrict or dissuade condors from venturing north into the ANF due to the nearby presence of pre-existing development. Preconstruction surveys, timing limitation, and avoidance mitigations such as BIO-7 (Impacts to raptors) and BIO-18 (Protect California condor) would reduce potential impact to the California condor.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to the California condor. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit.

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on avian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. California condors could be susceptible to herbicide applications through windborne drift of sprayed chemicals or through ingestion of prey that has been exposed to herbicide sprays. Certain herbicides are known to have different effects on bird species. For example, study has shown that in some cases, birds that hatch from eggs exposed to dicamba may experience reduced growth and stunted eye development (SERA 2004a), while glyphosate has been shown in some cases to lead to decreased body weight and changes in bone composition (SERA 2011a). Other herbicides such as sulfometuron methyl have been shown in limited studies to be of relatively low toxicity to birds (SERA 2004b). To reduce adverse impacts of herbicide application to bird species such as the California condor, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicide application will not occur within 24 hours a rain event with 70% or greater chance of occurring and would not be sprayed if wind speeds exceed six miles per hour (mph). In addition, if regular condor activity or a condor nest were detected within the Project area, a five- to 70-foot no-herbicide buffer, to be determined by an authorized biologist, would be instated and maintained around the activity area.

Summary – Although California condors are expected to be present within the Project area and its vicinity, effects to roosting or nesting habitat will not occur and potential effects to individuals that may be foraging or flying in the area are anticipated to be minimal during construction due to the large foraging range that this species utilizes. While habitat loss and degradation may occur, it is expected to be slight due to these large home ranges (Table 9) and the fact that the entire ANF is considered to be suitable foraging habitat for the California condor (N. Sill personal communication 2011). Avoidance and minimization measures would be enforced during construction to reduce potential impacts to the California condor and its habitat.

TABLE 9. CONSTRUCTION IMPACTS TO POTENTIAL CALIFORNIA CONDOR HABITAT.

	Temporary Impact (Ac.)	Minimum Permanent Impact (Ac.)	Maximum Permanent Impact (Ac.)	Total Impacted Area (Ac.)	Percentage of Total ANF (662,983 acres)
New 230 kV T-line	140.15	25.14	37.98	203.27	0.03%
Reconductoring	85.83	20.22	36.31	142.36	0.02%
New 230 kV Circuit	99.80	19.04	30.05	148.89	0.02%
Haskell Canyon Switching Station	-	-	13.67	13.67	< 0.01%
Total Impacts	**325.78**	**64.4**	**118.01**	**508.19**	**< 0.08%**

General practices that would reduce short-term or long-term effects to California condor include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to California condor include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-7 (Impacts to raptors), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-18 (Protect California condor). Formal consultation is being conducted with the USFWS to determine if any additional protection measures other than those mentioned above are necessary to protect California condors.

Effects Determination

The BRRTP construction, operation, and maintenance **may affect, but is not likely to adversely affect,** the California condor.

Coastal California Gnatcatcher

Mitigation Measures for Effects to Coastal California Gnatcatcher

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-11 Reduce avian collisions with and electrocutions on transmission lines. This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 5 for the full text of this mitigation measure)

BIO-15 Protect coastal California gnatcatcher and its habitat. This mitigation measure would require LADWP to carry out Project construction in suitable habitat for coastal California gnatcatcher outside of its breeding season. If this cannot be done, LADWP would be required to conduct protocol/focused surveys for this species; to avoid all identified territories or nests in consultation with BLM, CDFG, USFS, and/or USFWS as applicable; to reduce noise and disturbance in the vicinity of identified territories or nests; and to provide a qualified biological monitor for construction in occupied habitat. (Refer to Table 5 for the full text of this mitigation measure)

Effects on Coastal California Gnatcatcher

New 230 kV Transmission Line – The proposed new 230 kV line would cross a small amount of suitable habitat for the California gnatcatcher; however, it would not cross designated critical habitat. Construction-related impacts could include increased noise, traffic, or other human activities that would potentially disturb individual coastal California gnatcatchers that are foraging or passing through the Project area. These impacts would be localized and temporary. If construction cannot be conducted outside of the breeding season, LADWP would be required to conduct focused surveys for this species in areas of suitable habitat and to implement measures such as enforcing a no-disturbance buffer around territories or nesting sites, monitoring and reducing noise outputs from construction, and using a biological monitor for enforcement as necessary. LADWP would also enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. Minor clearing of vegetation (suitable habitat) would occur as a result of construction. Preconstruction focused surveys would be conducted, as necessary, to determine if certain areas of suitable habitat are being currently used by coastal California gnatcatchers.

Potential indirect effects to coastal California gnatcatchers from Project construction could include increased vulnerability to predation for individuals that move outside of their specific habitat patches during construction, possible inability to effectively forage due to construction-related stress or unfamiliarity with a new area, and habitat degradation resulting from the spread and establishment of non-native species or the deposition of dust onto surrounding vegetation as a result of vehicles or reestablishment of access roads if necessary. As stated above, LADWP would be required to implement particular measures as necessary to reduce disturbance to coastal California gnatcatchers. LADWP would also be required to prepare and implement a noxious weed control plan and a Fugitive Dust Emission

Control Plan. Human presence following construction is not expected to noticeably increase, as construction in these areas would all be conducted on existing transmission line towers.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for coastal California gnatcatcher impacts in the preceding section. The additional potential impacts resulting along Segment K are described below.

Designated critical habitat for the coastal California gnatcatcher is located within Segment K, a section of the existing transmission line that will be reconductored (72 FR 72009 72213). Approximately 2.9 miles of Segment K are within this patch of designated critical habitat, known as coastal California gnatcatcher critical habitat Unit 13. Should access roads need to be reestablished, they would need to be graded and cleared as necessary for construction access. This could potentially result in loss or alteration of designated critical habitat Unit 13 (72 FR 72009 72213). No disturbance is expected outside of the existing ROW, so any habitat that may need to be cleared for construction would be inside the ROW. However, the habitat is somewhat disturbed in this area due to general transmission maintenance activities such as tower access or brush-related fire prevention. Some towers may need to be modified or replaced either above- or below-ground to accommodate a new, heavier conductor. This would potentially require ground disturbance at these locations, which could result in possible habitat removal or disturbance to individual birds, which may temporarily leave the area because of construction activities. At least one coastal California gnatcatcher was observed in the winter of 2009/2010 in the Project area south of Unit 13, and this species is expected to be present along this portion of the Project. Further habitat degradation may occur through the deposition of dust or other contaminants onto leaves, which can reduce their vigor and reduce habitat quality in the area. Dust control measures would be implemented to help reduce this impact. Individuals in the area may be driven to dispersal by human presence and/or construction noise. If this occurs, it may lead to indirect injury or mortality if individuals are forced to relocate to an unfamiliar area, which may leave them open to predation. In addition, construction noise and impacts may result in displacement of individuals into less suitable habitat, which could lead to reduced fitness of individuals. Therefore, seasonal restrictions outside of the breeding season would be enforced; if these cannot be complied with, LADWP will be required to conduct preconstruction surveys for coastal California gnatcatchers in the Project area, utilize a biological monitor as necessary, enforce a no-disturbance buffer around known nests or territories, and monitor and reduce noise pollution. Observations of a coastal California gnatcatcher in and adjacent to a construction project outside of the nesting season showed that the gnatcatcher routinely left the area during construction hours but returned daily after construction stopped; the gnatcatcher was observed to continue returning to the area after the project was completed (Winkleman personal observation 2010). This may indicate a reasonable tolerance for noise disturbance by gnatcatchers. In addition to monitoring and reducing construction noise levels as necessary, LADWP would enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. Because nesting may occur outside of the officially-recognized nesting season, if construction approaches any undetected nests with eggs or young, the disturbance may cause the adult(s) to abandon the nest. However, permanent and temporary impacts consist of small-scale ground disturbances spread across a long linear area that will be fully offset by permanent protection and management of gnatcatcher designated critical habitat within the same critical habitat unit. Overall, the Project would not result in any loss in the ecological function (i.e., support for the breeding, feeding, and sheltering requirements of the gnatcatcher) of designated critical habitat within Unit 13. Thus, it has been determined that the Proposed Action is not likely to adversely affect designated critical habitat for the gnatcatcher.

New 230 kV Circuit – There may be direct or indirect construction impacts to coastal California gnatcatcher, expected to be present due to sightings around Castaic Lake during 2010 and 2011 bird use count surveys, one recorded sighting within 1.3 miles of the proposed ROW, and suitable coastal California gnatcatcher habitat identified during 2008 surveys (POWER 2010). Because of the locations of these habitat patches identified in 2008 and those where individuals were located in 2010 and 2011, it is possible that they could be destroyed or degraded by construction, as they are directly within the corridor. Other construction-related impacts include increased noise, traffic, or other human activities that would potentially disturb individual coastal California gnatcatchers that are foraging or passing through the Project area. These impacts would be localized and temporary. Potential indirect effects to coastal California gnatcatchers from Project construction could include increased vulnerability to predation for individuals that move outside of their specific habitat patches during construction, possible inability to effectively forage due to construction-related stress or unfamiliarity with a new area, and habitat degradation resulting from the spread and establishment of non-native species or the deposition of dust onto surrounding vegetation as a result of vehicles or reestablishment of access roads if necessary. LADWP would be required to prepare and implement both a noxious weed control plan and a Fugitive Dust Emission Control Plan to reduce the spread of non-native species and construction-related dust within the Project area. Preconstruction surveys would be conducted to determine usage of these areas by coastal California gnatcatchers, and biological monitoring during construction would follow should coastal California gnatcatchers be identified in the Project area.

Barren Ridge Switching Station Expansion – The Barren Ridge Switching Station does not occur within coastal California gnatcatcher habitat.

New Haskell Canyon Switching Station – The proposed switching station footprint is not within the vicinity of suitable coastal California gnatcatcher habitat, nor are there any documented occurrences. Preconstruction surveys and avoidance mitigations would further reduce potential impacts to the coastal California gnatcatchers occurring in the area.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations could result in impacts to coastal California gnatcatcher. Operation and maintenance activities will occur for 50 years. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit. Operation and maintenance of the BRRTP would likely cause minimal impacts to the species, as ongoing maintenance is currently being conducted along Segment K and the incremental increase in operation and maintenance activities for this Project would not substantially change from the current condition, and the reconductoring component within the existing ROW would cause short-term temporary impacts.

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on avian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Coastal California gnatcatchers could be susceptible to herbicide applications through windborne drift of sprayed chemicals or through ingestion of insects or vegetation that have been exposed to herbicide sprays. Certain herbicides are known to have different effects on bird species. For example, study has shown that in some cases, birds that hatch from eggs exposed to dicamba may experience reduced growth and stunted eye development (SERA 2004a), while glyphosate has been shown in some cases to lead to decreased body weight and changes in bone composition (SERA 2011a) and to have potentially adverse effects on insectivorous birds (Bautista 2006). Other herbicides such as sulfometuron methyl have been shown in limited studies to be of relatively low toxicity to birds (SERA 2004b). To reduce adverse impacts of herbicide application to bird species such as the coastal California gnatcatcher, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicide application will not occur within 24 hours a rain event with 70% or greater chance of occurring and would not be sprayed if wind speeds exceed six mph. In addition, if coastal California gnatcatchers or their nests were detected within the Project area, a five- to 70-foot no-herbicide buffer, to be determined by an authorized biologist, would be instated and maintained around the activity area. No herbicides would be sprayed within five to 70 feet, as determined by an authorized biologist, of coastal California gnatcatcher designated critical habitat Unit 13.

Summary – Both direct and indirect effects to the coastal California gnatcatcher may occur as a result of this Project and its construction. This species is known to be present on the southern end of the Project area in the reconductoring area known as Segment K. Individuals may be directly impacted by displacement, as well as loss or degradation of suitable habitat. Breeding is not expected to be affected, as construction would occur outside of the breeding season. Avoidance and minimization measures would be enforced during construction to avoid direct impacts to the coastal California gnatcatcher and its habitat.

Coastal California gnatcatcher critical habitat Unit 13 may be affected by Project construction. Because this area would be reconductored, specific impacts cannot be precisely estimated because they may change at each tower, depending on existing tower conditions and suitability of existing access roads. This would be determined after the tower inspection/engineering design phase of the Project. Using the same impact model as the construction of the new 230 kV transmission line, projected impacts from reconductoring in Unit 13 are as follows:

TABLE 10. IMPACTS TO COASTAL CALIFORNIA GNATCATCHER DESIGNATED CRITICAL HABITAT UNIT 13.

	Total Acreage of Habitat within Segment (Ac.)	Temporary Disturbance (Ac.)	Minimum Permanent Disturbance (Ac.)	Maximum Permanent Disturbance (Ac.)
Coastal California Gnatcatcher Designated Critical Habitat Unit 13	174.9	18.76	4.79	8.92

However, this estimate is on the conservative side, and areas affected would be within the existing ROW. Overall, the Project would not result in any loss in the ecological function (i.e., support for the breeding, feeding, and sheltering requirements of the gnatcatcher) of designated critical habitat within Unit 13. Thus, it has been determined that the Proposed Action is not likely to adversely affect designated critical habitat for the gnatcatcher. General practices that would reduce short-term or long-term effects to coastal California gnatcatcher include GP-8, GP-24, GP-33, GP-34, GP-35, GP-41, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term and long-term effects to coastal California gnatcatcher include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-8 (Avoid nesting season and limit disturbance of nesting birds [non-raptor species]), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-15 (Protect coastal California gnatcatcher and its habitat).

Effects Determination

The BRRTP construction, operation, and maintenance **may affect, but is not likely to adversely affect** the coastal California gnatcatcher, and designated critical habitat for the coastal California gnatcatcher.

Southwestern Willow Flycatcher

Mitigation Measures for Effects to Southwestern Willow Flycatcher

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-11 Reduce avian collisions with and electrocutions on transmission lines. This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 5 for the full text of this mitigation measure)

BIO-14 Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat. This mitigation measure would require LADWP to carry out Project construction in suitable habitat for western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo outside of their breeding seasons. If this cannot be done, LADWP would be required to conduct protocol/focused surveys for these species; to avoid all identified territories or nests in consultation with BLM, CDFG, USFS, and/or USFWS as applicable; to reduce noise and disturbance in the vicinity of identified territories or nests; and to provide a qualified biological monitor for construction in occupied habitat. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Southwestern Willow Flycatcher

New 230 kV Transmission Line – No known records or surveys identified occurrences the southwestern willow flycatcher within the proposed new 230 kV line (Proposed Action) ROW. Potential habitat does exist along the Proposed Action and, during construction of the Project, direct impacts to the species, including injury, mortality, loss of eggs or young, or excessive stress, could occur due to loss of habitat or construction noise or disturbance. Permanent effects, such as habitat loss, could occur due to the installation of permanent structures. The Project would include installation of towers, creation of new access roads, and creation of new work pads adjacent to the towers. Preconstruction surveys, timing limitations, and avoidance mitigations would further reduce potential impacts to southwestern willow flycatchers occurring in the area. Because this species is normally only present in the area during the nesting season (Dunn and Alderfer 2006), construction outside of this time period should avoid any direct effects to individual birds. If construction cannot be conducted outside of the nesting season then a qualified ornithologist would be required to conduct focused surveys for this species within areas of suitable habitat. This may result in a biological monitor being present in occupied areas during construction and may require no-disturbance buffers and monitoring and restrictions on construction noise. LADWP would also enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. The Project area would not fall within designated Critical Habitat for the southwestern willow flycatcher. Therefore, no adverse effects to Critical Habitat would occur as a result of the Project.

Project construction activities may result in increased noise levels, traffic, and human presence, which could in turn result in effects to this species that include displacement, increased vulnerability to predation, decreased fitness, altered behavior, altered foraging, and habitat degradation resulting from the establishment of non-native species. However, construction will, if possible, be scheduled outside of the nesting season. Because this species is normally only present in the area during the nesting season (Dunn and Alderfer 2006), construction outside of this time period should avoid any direct effects to individual birds. Further habitat degradation may occur through the deposition of dust or other contaminants onto leaves, which can reduce their vigor and reduce habitat quality in the area. LADWP would be required to prepare and implement a Fugitive Dust Emission Control Plan to reduce the spread of dust during construction. Furthermore, because nesting may occur outside of the officially recognized nesting season, if construction approaches any undetected nests with eggs or young, the disturbance may cause the adult(s) to abandon the nest. For this reason, construction will be timed to have the least effect possible on individuals. If this is unavoidable, preconstruction surveys will be conducted within suitable habitat in the Project area, and a biological monitor will remain on-site with construction to reduce human disturbance and noise impacts as possible, as described in BIO-14 (Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat).

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for southwestern willow flycatcher impacts in the preceding section. The only difference from the new 230 kV transmission line with respect to reconductoring is Segment K, and no suitable habitat or known occurrences have been documented along this segment. Therefore, no impacts to this species are anticipated from the construction of this Project component.

New 230 kV Circuit – There is no suitable southwestern willow flycatcher habitat nor have any individuals been documented along this corridor. Therefore, no impacts to this species or its designated critical habitat are anticipated from the construction of this Project component.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known suitable habitat or occurrences have been documented for the southwestern willow flycatcher. Therefore, no impacts to this species or its designated critical habitat are anticipated from the construction of this Project component.

New Haskell Canyon Switching Station – No southwestern willow flycatcher habitat or individuals have been documented within the proposed Haskell Canyon Switching Station footprint. Preconstruction surveys, timing limitations and avoidance mitigations would further reduce potential impacts to southwestern willow flycatcher occurring in the area.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to southwestern willow flycatchers. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit.

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on avian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Southwestern willow flycatchers could be susceptible to herbicide applications through windborne drift of sprayed chemicals or through ingestion of insects or vegetation that have been exposed to herbicide sprays. Certain herbicides are known to have different effects on bird species. For example, study has shown that in some cases, birds that hatch from eggs exposed to dicamba may experience reduced growth and stunted eye development (SERA 2004a), while glyphosate has been shown in some cases to lead to decreased body weight and changes in bone composition (SERA 2011a) and to have potentially adverse effects on insectivorous birds (Bautista 2006). Other herbicides such as sulfometuron methyl have been shown in limited studies to be of relatively low toxicity to birds (SERA 2004b). To reduce adverse impacts of herbicide application to bird species such as the southwestern willow flycatcher, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicide application will not occur within 24 hours a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, and would not be sprayed if wind speeds exceed six mph. In addition, if southwestern willow flycatchers or their nests are detected within the Project area, a five- to 70-foot no-herbicide buffer, to be determined by an authorized biologist, would be instated and maintained around the activity area.

Summary – Southwestern willow flycatchers are not known to be present within the Project area, although willow flycatchers or an indeterminate subspecies have been detected previously. Suitable habitat to support this species is present within the Project area and may be affected by construction activities, resulting in possible habitat loss or degradation depending on final construction sites and access routes. Due to the presence of existing transmission lines throughout the entire Project area and abundant perching opportunities on the individual transmission towers, predation from raptors and perching habitat for raptors is not expected to substantially increase from the addition of one transmission line. Suitable habitat is present in many of these areas that already contain transmission lines. Breeding is not expected to be affected, as construction would occur outside of the breeding season. Avoidance and minimization measures would be enforced during construction to reduce potential impacts to the southwestern willow flycatchers and their habitat.

General practices that would reduce short-term or long-term effects to southwestern willow flycatcher and to riparian habitat include GP-3, GP-5, GP-8, GP-11, GP-12, GP-17, GP-19 GP-35, GP-38, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to southwestern willow flycatcher include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over

Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-8 (Avoid nesting season and limit disturbance of nesting birds [non-raptor species]), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-14 (Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat).

Effects Determination

The proposed BRRTP **may affect, but is not likely to adversely affect** the southwestern willow flycatcher.

Least Bell's Vireo

Mitigation Measures for Effects to Least Bell's Vireo

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-11 Reduce avian collisions with and electrocutions on transmission lines. This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 5 for the full text of this mitigation measure)

BIO-14 Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat. This mitigation measure would require LADWP to carry out Project construction in suitable habitat for western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo outside of their breeding seasons. If this cannot be done, LADWP would be required to conduct protocol/focused surveys for these species; to avoid all identified territories or nests in consultation with BLM, CDFG, USFS, and/or USFWS as applicable; to reduce noise and disturbance in the vicinity of identified territories or nests; and to provide a qualified biological monitor for construction in occupied habitat. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Least Bell's Vireo

New 230 kV Transmission Line – No known records or surveys found the least Bell's vireo to be present on the proposed new 230 kV line ROW (Proposed Action). If present in the area during construction, individuals of different life stages may be directly impacted as a result of construction activities. Potential habitat was identified during 2008 surveys in Dry Canyon, and while this habitat may be affected or partially lost due to construction of the new 230 kV transmission line, least Bell's vireos are not known to be present in it (POWER 2010). Breeding of any least Bell's vireos is not expected to be affected by construction, as construction would be conducted outside of the nesting season. Because this species is normally only present in the area during the nesting season (Dunn and Alderfer 2006), construction outside of this time period should avoid any direct effects to individual birds. If construction cannot occur outside of the breeding season, then a qualified ornithologist would conduct focused surveys in areas of suitable habitat within the Project area. Any detected territories or nests would be protected with a no-disturbance buffer, and a biological monitor would oversee construction near these areas and near occupied habitat. LADWP would also be required to monitor and reduce the noise from its construction to avoid adverse impacts to the nesting activity or young, and would enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. The new 230 kV line would not fall within designated Critical Habitat for the least Bell's vireo. Therefore, no adverse effects to Critical Habitat would occur as a result of the new 230 kV line.

Project construction activities may result in increased noise levels, traffic, and human presence, which could result in indirect effects to this species such as displacement, increased vulnerability to predation, decreased fitness, altered behavior, altered foraging, and habitat degradation resulting from the establishment of non-native species. Construction during the nesting season could result in nest loss or abandonment and would therefore be restricted to areas outside of detected nest sites or territories and construction noise levels would be restricted, as described above. LADWP would be required to prepare and implement a noxious weed control plan to reduce the spread of noxious weeds in the Project area. Further habitat degradation may occur through the deposition of dust or other contaminants onto leaves, which can reduce their vigor and reduce habitat quality in the area. LADWP would be required to prepare and implement a Fugitive Dust Emission Control Plan to reduce the spread of Project-related dust. Furthermore, because nesting may occur outside of the officially recognized nesting season, if construction approaches any undetected nests with eggs or young, the disturbance may cause the adult(s) to abandon the nest. For this reason, construction will be timed outside the breeding season to have the least effect possible on individuals. If this is unavoidable, LADWP would implement several protective measures as described above.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for least Bell's vireo impacts in the preceding section. The only difference from the new 230 kV transmission line with respect to reconductoring is Segment K, and no potential habitat or known occurrence have been documented along this segment; therefore, no impacts to least Bell's vireo are anticipated from this Project component.

New 230 kV Circuit – Least Bell's vireos may be present within the Project area around Castaic Lake and Castaic Lagoon. A population of at least 15 individuals was spotted in this area by BonTerra Consulting in 2005 over ten separate visits (CDFG 2011a). The location of this population is within 0.5 mile of the new 230 kV circuit. However, the transmission line is approximately 375 feet higher in elevation—and set back from the top of a hill—than the patch of suitable habitat where the vireos were previously identified, which is at the bottom of a canyon. It is not expected that any vegetation removal in this area would be required, as the corridor is not close enough and the paved road would likely be maintained by the management of the Castaic Lake State Recreation Area, of which this road is a part. There may be small amounts of tree trimming required on the edge of the road if equipment cannot pass without hitting branches. While individual least Bell's vireos may be affected by the noise of passing vehicles if Project equipment enters and exits the ROW via the paved road that passes by the vireo site, further effects to least Bell's vireos or their habitat are not expected in this area due to its topographical features. Because the paved road that passes adjacent to the vireo sighting location is a public road within the Castaic Lake State Recreation Area, birds in the area likely have become acclimated to periodic disturbances from vehicular traffic on this roadway. Should construction vehicles enter and exit the ROW in this area from a different road, of which there are several in the area that could be used if necessary, direct impacts from construction to any vireos which may be present are expected to be negligible. The population of least Bell's vireo in this area was last recorded in 2005; preconstruction surveys would be conducted in this area to determine if this species is still present. Should individuals be detected, appropriate follow-up protocols according to mitigation measure BIO-14 (Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat) would be implemented.

Indirect impacts to least Bell's vireo could occur from the new 230 kV circuit due to habitat degradation. Construction vehicles and equipment could transport non-native plant seeds on their tires or carriages and cause non-native plant species to spread into areas where they may be less abundant or not present, such as within the areas that contain suitable habitat for least Bell's vireo. LADWP would implement noxious weed control as described above. Construction on towers or grading of existing access roads may also result in dust deposition onto surrounding vegetation, which could affect the ability or effectiveness of plants to photosynthesize. LADWP would implement dust control measures as described above. Long-term periodic human presence and use of access roads by maintenance or security vehicles may continue to result in habitat degradation as described above, but the effects would be relatively minor, as most activity would likely consist of passing by while patrolling the ROW, and should not result in off-road activity—such as foot traffic—unless a problem is discovered.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known habitat or occurrences have been documented for the least Bell's vireo; therefore, no impacts are anticipated to occur from this Project component.

New Haskell Canyon Switching Station – No least Bell's vireo habitat or individuals have been documented within the vicinity of the proposed Haskell Canyon Switching Station. Preconstruction surveys, timing limitations, and avoidance mitigations would further reduce potential impacts to least Bell's vireo occurring in the area.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to least Bell's vireo. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit.

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on avian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Least Bell's vireo could be susceptible to herbicide applications through windborne drift of sprayed chemicals or through ingestion of insects or vegetation that have been exposed to herbicide sprays. Certain herbicides are known to have different effects on bird species. For example, study has shown that in some cases, birds that hatch from eggs exposed to dicamba may experience reduced growth and stunted eye development (SERA 2004a), while glyphosate has been shown in some cases to lead to decreased body weight and changes in bone composition (SERA 2011a) and to have potentially adverse effects on insectivorous birds (Bautista 2006). Other herbicides such as sulfometuron methyl have been shown in limited studies to be of relatively low toxicity to birds (SERA 2004b). To reduce adverse impacts of herbicide application to bird species such as the least Bell's vireo, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicide application will not occur within 24 hours a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, and would not be sprayed if wind speeds exceed six mph. In addition, if least Bell's vireos or their nests are detected within the Project area, a five- to 70-foot no-herbicide buffer, to be determined by an authorized biologist, would be instated and maintained around the activity area.

Summary – Least Bell's vireo is known to be present as of 2005 near what is known as Segment J, a section of existing transmission line that would have a new 230 kV circuit placed on it. However, because of the proximity of this known population to public recreation—the Castaic Lake State Recreation Area—and a public road, construction effects are not expected to substantially increase above the daily ambient effects. This species is not known to be present elsewhere within the Project area. Breeding is not expected to be affected, as construction would occur outside of the breeding season. If nesting season cannot be avoided by construction, LADWP would implement various measures to protect any least Bell's vireos in the area, as described above. Habitat degradation may occur as a result of construction activities or even after construction during routine maintenance or security patrols. Avoidance and minimization measures would be enforced during construction to protect least Bell's vireo and its habitat. General practices that would reduce short-term or long-term effects to least Bell's vireo and to riparian habitat include GP-3, GP-5, GP-8, GP-11, GP-12, GP-17, GP-19, GP-35, GP-38, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to least Bell's vireo include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-8 (Avoid nesting season and limit disturbance of nesting birds [non-raptor species]), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-14 (Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat).

Effects Determination

Based on the analysis provided above, the BRRTP **may affect, but is not likely to adversely affect**, the least Bell's vireo.

Western Yellow-billed Cuckoo

Mitigation Measures for Effects to Western Yellow-billed Cuckoos

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-11 **Reduce avian collisions with and electrocutions on transmission lines.** This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 5 for the full text of this mitigation measure)

BIO-14 **Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat.** This mitigation measure would require LADWP to carry out Project construction in suitable habitat for western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo outside of their breeding seasons. If this cannot be done, LADWP would be required to conduct protocol/focused surveys for these species; to avoid all identified territories or nests in consultation with BLM, CDFG, USFS, and/or USFWS as applicable; to reduce noise and disturbance in the vicinity of identified territories or nests; and to provide a qualified biological monitor for construction in occupied habitat. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Western Yellow-billed Cuckoo

New 230 kV Transmission Line – Western yellow-billed cuckoo is not known to be present in the proposed new 230 kV transmission line corridor and was not detected during surveys of riparian habitat. Tower construction and grading of new and existing access roads would result in habitat and vegetation loss, as well as possible injury or mortality. Tree trimming is likely in order to allow vehicles and equipment to pass without causing damage to trees by breaking branches; this would result in an unknown amount of habitat loss and possibly injury or mortality of adults or young. Construction-related impacts may include noise, traffic, or other human activities that would potentially disturb individual yellow-billed cuckoos that are foraging or passing through the vicinity of the Project area. Construction activity or excessive noise could also result in nest abandonment or a reduction in reproduction activity. Depending on specific placement of new towers and access roads, some habitat loss may be permanent, reducing the amount of suitable habitat in this area for the future. Preconstruction surveys, timing limitations (no construction activity would occur near occupied western yellow-billed cuckoo habitat from June through mid-August), and avoidance mitigations would further reduce potential impacts to western yellow-billed cuckoos occurring in the area. Because this species is normally only present in the area during the nesting season (Dunn and Alderfer 2006), construction outside of this time period should avoid any direct effects to individual birds. If construction cannot occur outside of the breeding season, then a qualified ornithologist would conduct focused surveys in areas of suitable habitat within the Project area. Any detected territories or nests would be protected with a no-disturbance buffer, and a biological monitor would oversee construction near these areas and near occupied habitat. LADWP would also be required to monitor and reduce the noise from its construction to avoid adverse impacts to the nesting activity or young, and would enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time.

Potential habitat for this species is present in San Francisquito Canyon and Dry Canyon, which could be indirectly impacted by construction activities. Potential indirect impacts to western yellow-billed cuckoos from construction could include increased vulnerability to predators should any individual cuckoos be present and have to leave the area and utilize unfamiliar habitat (which may also reduce individual fitness), and habitat degradation due to potential spread and establishment of non-native plant species or dust deposition. Their habitat could be degraded by non-native weed species should seeds get stuck in vehicle tires or carriages and fall off within suitable areas of habitat. LADWP would be required to prepare and implement a noxious weed control plan to minimize the spread of noxious weeds in the Project area. Dust generated by the Project during transport or construction has the potential to settle onto adjacent vegetation, possibly decreasing plants' vigor by reducing their effectiveness at photosynthesis. LADWP would be required to prepare and implement a Fugitive Dust Emission Control Plan to reduce the spread of Project-related dust. Furthermore, because nesting may occur outside of the officially recognized nesting season, if construction approaches any undetected nests with eggs or young, the disturbance may cause the adult(s) to abandon the nest. For this reason, construction will be timed outside of the nesting season to have the least effect possible on individuals. If this is unavoidable, LADWP would implement several protective measures as described above.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for western yellow-billed cuckoo impacts in the preceding section. The only difference from the new 230 kV transmission line with respect to reconductoring is Segment K, and no potential habitat or known occurrence have been documented along this segment; therefore, no impacts to this species are anticipated from this Project component.

New 230 kV Circuit – No western yellow-billed cuckoo habitat or individuals have been documented along this corridor; therefore, impacts to this species resulting from this Project component are not anticipated.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known habitat or occurrences have been documented for the western yellow-billed cuckoo; therefore, impacts to this species resulting from this Project component are not anticipated.

New Haskell Canyon Switching Station – No western yellow-billed cuckoo habitat or individuals have been documented within the vicinity of the proposed Haskell Canyon Switching Station. Preconstruction surveys, timing limitations, and avoidance mitigations would further reduce potential impacts to western yellow-billed cuckoos occurring in the area. The Haskell Canyon Switching Station would result in no effect to the western yellow-billed cuckoo.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to western yellow-billed cuckoos. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit.

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on avian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Western yellow-billed cuckoos could be susceptible to herbicide applications through windborne drift of sprayed chemicals or through ingestion of insects or vegetation that have been exposed to herbicide sprays. Certain herbicides are known to have different effects on bird species. For example, study has shown that in some cases, birds that hatch from eggs exposed to dicamba may experience reduced growth and stunted eye development (SERA 2004a), while glyphosate has been shown in some cases to lead to decreased body weight and changes in bone composition (SERA 2011a) and to have potentially adverse effects on insectivorous birds (Bautista 2006). Other herbicides such as sulfometuron methyl have been shown in limited studies to be of relatively low toxicity to birds (SERA 2004b). To reduce adverse impacts of herbicide application to bird species such as the western yellow-billed cuckoo, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicide application will not occur within 24 hours a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, and would not be sprayed if wind speeds exceed six mph. In addition, if western yellow-billed cuckoos or their nests are detected within the Project area, a five- to 70-foot no-herbicide buffer, to be determined by an authorized biologist, would be instated and maintained around the activity area.

Summary – Both direct and indirect impacts may occur to western yellow-billed cuckoos as a result of this Project and its construction. While individuals of this species are not known to be present within the Project area, any individuals which may be present during irregular—early or later than normal—breeding times could be displaced as a result of construction. Suitable habitat for this species is located within the Project area; this habitat may be lost or degraded as a result of construction or construction activities. Breeding is not expected to be affected, as construction would occur outside of the breeding season. Avoidance and minimization measures would be enforced during construction to avoid or minimize potential effects to western yellow-billed cuckoos and their habitat.

General practices that would reduce short-term or long-term effects to western yellow-billed cuckoo and to riparian habitat include GP-3, GP-5, GP-8, GP-11, GP-12, GP-17, GP-19, GP-35, GP-38, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to western yellow-billed cuckoos include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-8 (Avoid nesting season and limit disturbance of nesting birds [non-raptor species]), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-14 (Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat).

Effects Determination

Based on the analysis above, the Proposed Action **may affect, but is not likely to adversely affect,** the yellow-billed cuckoo.

7.1.3 Reptile

Desert Tortoise

Mitigation Measures for Effects to Desert Tortoise

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-23 Protect desert tortoise and prevent habitat loss. This mitigation measure would require LADWP to conduct pre-construction surveys for desert tortoise within the Project vicinity; to flag and avoid identified burrows; to retain a qualified and permitted biological monitor on-site or on-call during Project construction in suitable desert tortoise habitat; to halt construction if a tortoise is observed near construction; to restrict work hours and vehicle speeds; to undergo a desert tortoise education program for all construction personnel; to remove all trash from the construction area daily; and to install tortoise-proof fencing where tortoises are known to occur during construction. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Desert Tortoise

New 230 kV Transmission Line – The new 230 kV transmission line corridor would cross approximately four miles of occupied desert tortoise habitat (POWER 2009). The northern portion of the 230 kV corridor supports the highest quality tortoise habitat, and most tortoises were observed in these areas (Appendix D). Project construction could result in direct adverse effects to desert tortoise. Injury or mortality could occur to tortoises underground in undetected burrows that are driven over by construction vehicles or equipment, or to tortoises that are under vegetation and are not detected during construction or preconstruction surveys. Preconstruction surveys would be conducted within suitable areas in the Project area; burrows within the Project area would be excavated and tortoises relocated, while burrows within 100 feet of the construction zone would be flagged for avoidance and monitoring during construction. Exclusion fencing would be installed along the construction boundaries to keep tortoises from entering the area during construction. Permanent habitat loss would occur as a result of the construction of new transmission towers and new access roads, resulting in decreased forage and vegetative cover for tortoises in the area. Because tortoises may use desert washes as habitat, excessive disturbance to these areas as a result of construction would degrade and possibly reduce habitat further. LADWP would be required to minimize disturbance and vegetation removal to the extent necessary to complete construction and would be restricted to the approved Project area. Since vegetation re-growth is a slow process in this arid climate, creosote bushes large enough to provide good cover would take a decade to revegetate the area. During construction, increased predation could occur from ravens and coyotes, which are attracted to human activity to scavenge for food. To reduce scavenger attraction, workers would dispose of trash regularly off-site. Tortoises that wander too close to construction would require manual relocation by an authorized biologist and would likely undergo stress during the movement process and possibly afterward, until they are able to find suitable shelter again. While there is limited data on the effects of noise on tortoises, the USFWS (2011) suggests that short-term exposure to hearing loss and physiological changes due to noise—in this case jet aircraft—are unlikely to be dangerous to the animals' wellbeing. All tortoises within the construction area would be moved out of the immediate area, but construction noise could still affect tortoises that are in areas adjacent to construction. LADWP would also enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time.

Habitat loss and reduced vegetation may subject desert tortoises to increased predation from aerial predators by decreasing the amount of cover available to hide under. Habitat loss from construction will also decrease the amount of available forage. Desert tortoises will be forced to move further distances in search of food, potentially causing further stress and increasing the chance of predation. Additionally, construction of a new transmission line would increase nesting and perching opportunities for raptors or corvids, increasing the likelihood of predation on desert tortoises. As described in its Avian Protection Plan for BRRTP construction, LADWP would site and design its new towers so as to reduce perching opportunities by predators (LADWP 2011). After construction is completed, injury or mortality from vehicle collisions may occur during maintenance activities and security patrols.

The Project would comply with all regulations regarding protection of the desert tortoise. The following recommended mitigation measures are expected to avoid and minimize adverse impacts to this species:

- Pre-construction surveys for presence along the proposed route,
- Restricting surface disturbance to the minimum amount needed for construction,
- Educating construction personnel about listed species,
- Full-time construction monitoring by authorized biologists,
- Placement of tortoise fencing in areas of known tortoise habitat,
- Restoring habitat in areas temporarily disturbed during project construction,
- Payment of mitigation fees for habitat compensation,
- Imposing speed limits of 20 mph through desert tortoise habitat, and
- Requiring employees to inspect under vehicles before driving.

The above list is not comprehensive; a detailed list of proposed mitigations is included in BIO-23. These mitigations would reduce impacts to the desert tortoise.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for desert tortoise impacts in the preceding section. The only difference from the Proposed Action with respect to reconductoring is Segment K, and no potential habitat or known occurrence have been documented along this segment.

New 230 kV Circuit –No known desert tortoise habitat or individuals have been documented along this corridor. The new 230 kV circuit would not affect desert tortoise.

Barren Ridge Switching Station Expansion – The proposed expansion of the Barren Ridge Switching Station would potentially result in direct impact to the desert tortoise. The additional 2.7 acres required for the expansion would be within known occupied desert tortoise habitat. Tortoises were observed during the 2008 surveys (POWER 2009). Any tortoises which are present within the construction area would be relocated and would be permanently excluded from this area. Because the average desert tortoise home range can be anywhere from 10 to 100 acres (Meyer 2008), the 2.7-acre expansion of the existing Barren Ridge Switching Station would remove approximately 2.7 – 27% of the average home range. Because this operation would be an expansion of the existing facility and not a separate facility in a different patch of habitat, it would increase the size of the continuous disturbance without forcing any local desert tortoises to travel through fragments of habitat between facilities. Expansion of the switching station may indirectly lead to tortoise mortality if any tortoises are present within the footprint by increasing their likelihood of predation by ravens. This could occur if a tortoise is moved outside of the construction area and does not have a burrow yet, or by the increased human presence increasing the number of ravens on-site. Direct mortality could occur if desert tortoises are missed during clearance surveys and crushed during construction. Presence of a qualified biological monitor and implementation of tortoise mitigation as described in BIO-23 would reduce the risk of some of these impacts, although habitat loss is unavoidable. Construction would result in degradation of desert tortoise habitat due to soil and vegetation disturbance, introduction of non-native plant species, habitat fragmentation, and increased noise, traffic, equipment movement, and human presence. The Barren Ridge Switching Station expansion would result in an adverse affect to the desert tortoise due to direct activities in occupied habitat. Preconstruction surveys, timing limitations, and avoidance measures would further reduce potential impacts to the desert tortoise.

New Haskell Canyon Switching Station – No known desert tortoise habitat or tortoises have been documented within the proposed Haskell Canyon Switching Station footprint. The Haskell Canyon Switching Station would not affect the desert tortoise.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations could pose a threat to the desert tortoise. Ground and air monitoring of the lines would be limited in areas of high desert tortoise density and during their more active periods (spring time, early to mid morning in summer, and on rainy days outside of the hibernation period). Temporary increased human presence, noise, and dust may occur and result in moderate impacts to the desert tortoise. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on measures to prevent adverse impacts to the desert tortoise. However, maintenance is often required during heavy rainfall events that may draw the tortoise out of its burrow, exposing it to increased risk from moving equipment. Operation and maintenance of the BRRTP would likely cause adverse impacts to the desert tortoise due to incidental takes due to moving vehicles. Preconstruction surveys, timing limitations, and avoidance measures would further reduce potential impacts to the desert tortoise. Because desert tortoise does not occur within the Project area on NFS lands, an analysis is not included here for potential effects to this species as a result of herbicide application on the ANF.

Summary – Both direct and indirect effects to the desert tortoise may occur as a result of this Project and its construction. Habitat loss and degradation in the northern sections of the Project are unavoidable due to the widespread presence of suitable habitat and large ranges of individual tortoises. Long-term increased predation is probably unlikely due to the presence of two existing transmission lines in this area; however, short-term predation may increase if scavengers are attracted to human activities during construction. Food trash would be disposed of regularly to reduce the incentive for scavenger predators to visit construction sites. Avoidance and mitigation measures would be enforced during construction to reduce potential impacts to the desert tortoise, which is known to be present in the Project area. General practices that would reduce short-term or long-term effects to desert tortoise include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to desert tortoise include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-23 (Protect desert tortoise and habitat loss).

Effects Determination

Based on the analysis provided above, the BRRTP **may affect, and is likely to adversely affect**, the desert tortoise.

7.1.4 Amphibians

California Red-legged Frog

Mitigation Measures for Effects to California Red-legged Frog

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the

Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-24 Protect arroyo toad and California red-legged frog. This mitigation measure would require LADWP to conduct protocol surveys for arroyo toad and California red-legged frog in suitable habitat for these species within the Project vicinity; to retain a qualified biological monitor in occupied habitat during Project construction; to remove trash daily; to restrict construction dates, work hours, and vehicle speeds; and to promptly clean hazardous material spills in potentially occupied habitat and report spills to the USFWS and USFS. The biological monitor(s) will also be expected to take all measures to prevent the spread of diseases between sites. (Refer to Table 5 for the full text of this mitigation measure)

Effects to California Red-legged Frog

New 230 kV Transmission Line – Based on known locations and protocol survey results of California red-legged frog in the vicinity of the proposed new 230 kV line, direct effects to individual frogs are not expected (POWER 2010). California red-legged frogs are only known to occur within the St. Francis Dam reach of San Francisquito Creek, which is located several miles downstream of where the transmission line would cross into San Francisquito Canyon and would be separated from the transmission line in Dry Canyon by a steep mountainside. In addition, the morphology of San Francisquito Creek is typical of a semi-arid region where flow is extremely variable and sediment flux is highly episodic. The total long-term coarse sediment yield for the range of flows for San Francisquito Creek was found to be greater than 0.0625 mm (tons/day) (Stillwater Sciences 2009). Therefore it was determined that the designated critical habitat unit LOS-1 would not be affected by construction or resulting sedimentation.

Based on protocol surveys, suitable habitat was found directly under the transmission line in Dry Canyon in an area known as Drinkwater Flat, where there is a perennial section of streambed within coast live oak riparian woodland. The transmission line would cross directly through this area, which could possibly result in habitat loss or degradation depending on exact tower locations and availability of existing access roads. Preconstruction surveys, timing limitations (no construction activity would occur within one mile of occupied California red-legged frog habitat from November 1 to March 31 or within 0.5 mile of occupied habitat from April 1 to October 31), and avoidance mitigations would further reduce potential impacts to California red-legged frog potentially occurring in the area. Encroachment into this area is not expected except possibly by foot traffic during the final line-stringing phase. Direct injury or mortality could occur during this process if an individual is present and crushed by foot traffic. However, because California red-legged frogs are not restricted to water and are known to pass over land during migration, there could also be inadvertent crushing by equipment along the access road or in the tower construction areas (Bulger et al. 2003, Rathbun and Scott 2010). To reduce the likelihood of crushing any frogs, an exclusion fence would be placed around the perimeter of construction zones and all construction would be restricted to daylight hours.

Construction of the new 230 kV line could result in indirect adverse impacts to California red-legged frogs. Decreased fertility or inability to breed could occur due to increased stress, unsuitable breeding habitat, or failure to find a mate in new habitat patches. Construction noise and vibration could cause any local California red-legged frogs to abandon the general area, increasing the possibility that they could be preyed upon, become injured, or die (USFWS 2003). However, California red-legged frogs are not expected to be present or encountered during construction and the above scenarios are unlikely. LADWP would also enforce noise reduction measures such as using noise reduction elements on construction equipment and minimizing vehicle idling time. Additionally, construction could result in habitat degradation as a result of increased non-native plant species due to plant seeds attaching to vehicle tires or carriages and falling off in streambeds. LADWP would be required to prepare and implement a noxious weed control plan to reduce the spread of noxious weeds within the Project area. Dust raised by vehicles or construction of transmission towers or access roads could settle on surrounding vegetation, possibly reducing the effectiveness of individual plants' photosynthetic processes. LADWP would be required to prepare and implement a Fugitive Dust Emission Control Plan to reduce the spread of Project-related dust during construction. Habitat degradation may occur after the Project has been constructed due to ongoing maintenance and security patrols in the future, but it is expected that patrols would likely stay on the main access road unless a problem is discovered that requires individual tower access.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for California red-legged frog impacts in the preceding section. The only difference from the Proposed Action with respect to reconductoring is Segment K, and no potential habitat or known occurrence have been documented along this segment; therefore, impacts to this species resulting from this Project component are not anticipated.

New 230 kV Circuit – The only probable California red-legged frog detected during the 2008 and 2009 protocol surveys was a tadpole found on April 8, 2008 at Site Assessment #1 under the location where the reconductoring would cross San Francisquito Creek (POWER 2010). However, because of the lack of any other observed potential California red-legged frog tadpoles combined with the general inadequacy of the site for this species' breeding requirements, it is likely that the tadpole washed downstream from the known occupied habitat approximately four miles upstream. Due to a sharp rise in precipitation in the Saugus area in the two months preceding the identification of this tadpole, this is a possible scenario

(CDEC 2010). In this case, because the habitat at this location is not normally suitable to support this species, it is unlikely to be present, particularly because the site was observed to be dry during subsequent visits. However, should this species be present in this section of San Francisquito Creek again, several construction impacts could occur. Because the tadpole was present in a portion of the creek that is adjacent to a residence and crossing the creek is the only way for the residents to reach their home, this area likely experiences daily vehicle traffic, resulting in periodic disruption of water and stirring of sediment in the stream's substrate. Increasing the number of vehicles passing through this area by adding construction vehicles and equipment would increase the amount of sedimentation in the creek in this area and increase the risk of habitat degradation along the creek through spread of non-native plant seeds around the banks and vehicular fluid spills. An alternate, less direct route is available to access this section of the transmission line if it is necessary to avoid this crossing during construction. Daily disturbance would reduce the likelihood of frogs being present or nesting in the immediate road crossing, but if egg masses, tadpoles, or frogs are present then the risk of crushing would be increased. Project mitigation would require an authorized biologist to conduct surveys if habitat or conditions are suitable for California red-legged frogs to be present, and if found in the vicinity of the stream crossing, the crossing would be excluded from access while inundated. No other areas were found on this segment that had the potential to support the California red-legged frog and based on the survey results, no suitable habitat is located along this Project component. Therefore, impacts to this species resulting from this Project component are not anticipated.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known habitat or occurrences have been documented for the California red-legged frog, and impacts to this species resulting from this Project component are not anticipated.

New Haskell Canyon Switching Station – No known California red-legged frog habitat or individuals have been documented within the proposed Haskell Canyon Switching Station footprint or access roads that lead to the switching station site.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to California red-legged frog. Temporary increased human presence, noise, and dust may occur and result in impacts; however, they would likely be negligible given the sporadic nature of these activities. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and the incorporation of riparian area avoidance and permit measures (BIO-3). Construction crews will also avoid impacting the streambeds and banks of any streams along the route, including access roads, to the extent feasible. When construction or maintenance work affects the bed, bank or margins of a stream under CDFG jurisdiction, LADWP will notify CDFG as required under Fish and Game Code Section 1602, which may include securing a Streambed Alteration Agreement (GP -54).

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on amphibian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Herbicides can be particularly harmful to amphibian species, which have semi-permeable skin that readily absorbs both terrestrial and aquatic toxic compounds. Previous research by Relyea (2005) has indicated that polyethoxylated tallowamine (POEA) surfactants may be highly lethal to amphibians. Surfactants are additives to herbicides that can improve herbicide effectiveness by increasing the spreading and sticking properties of the herbicide on plant surfaces and by reducing the water's surface tension and allowing for greater movement of the herbicide through plants' cuticles (the barrier that normally prevents water loss from the plants) (Miller and Westra 1998). Relyea (2005) found that direct spray of glyphosate a POEA surfactant to both aquatic (tadpole) and terrestrial (juvenile) phases of different species of anurans resulted in 98% mortality of aquatic subjects after three weeks and 79% mortality of terrestrial subjects after one day. However, glyphosate without a POEA surfactant has been demonstrated to be of relatively low toxicity to amphibians (Relyea 2005). Conclusive data for the effects to amphibians from many other herbicides is lacking. To reduce adverse impacts of herbicide application to amphibian species such as the California red-legged frog, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicides would only be used with the least toxic surfactant available, would not be applied within 24 hours of a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, would not be sprayed if wind speeds exceed six mph, and would not be applied within a five- to 70-foot buffer—to be determined by an authorized biologist—of any known California red-legged frog occurrences. No herbicides would be applied within California red-legged frog designated critical habitat unit LOS-1.

Summary – Direct impacts to California red-legged frogs are not expected as a result of this Project and its construction. The only known population of this species is located outside of the Project area. Based on conditions and topography outside of this occupied habitat, individuals from this population are not expected to migrate into work areas. However, suitable habitat for this species is located within or around work areas, such as within Drinkwater Flat. This habitat is not known to be occupied, but depending on final structure locations and access roads, it may be affected or degraded by Project construction. Avoidance and minimization measures would be enforced during construction to avoid potential impacts to the California red-legged frog and its habitat. General practices that would reduce short-term and long-term effects to California red-legged frog and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to California red-legged frog and its habitat include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-24 (Protect arroyo toad and California red-legged frog).

There is no designated critical habitat located within the Project area, although Unit LOS-1 is located approximately 0.20 mile west of the proposed new 230 kV transmission line centerline at its closest proximity. Construction access would be limited to roads that avoid entering this critical habitat, thus avoiding direct impacts to it.

Effects Determination

Based on the analysis provided, the BRRTP **may affect, but is not likely to adversely affect**, the California red-legged frog. In addition the Proposed Action will have **no effect** on designated critical habitat for the California red-legged frog.

Arroyo Toad

Mitigation Measures for Effects to Arroyo Toad

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 **Use of Existing Water Crossings.** This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the

Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 5 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

BIO-24 Protect arroyo toad and California red-legged frog. This mitigation measure would require LADWP to conduct protocol surveys for arroyo toad and California red-legged frog in suitable habitat for these species within the Project vicinity; to retain a qualified biological monitor in occupied habitat during Project construction; to remove trash daily; to restrict construction dates, work hours, and vehicle speeds; and to promptly clean hazardous material spills in potentially occupied habitat and report spills to the USFWS and USFS. The biological monitor(s) will also be expected to take all measures to prevent the spread of diseases between sites. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Arroyo Toad

New 230 kV Transmission Line – Construction activities could potentially directly and indirectly affect arroyo toads as a result of habitat (breeding and upland) removal and may cause harm or harassment and direct disturbance to arroyo toads. However, no arroyo toads were observed during three years of protocol surveys along the proposed alignment. Surveys included areas up to three miles from the transmission corridor to account for potential indirect impacts from construction (POWER 2010). Project construction could also result in habitat degradation as a result of vehicles leaking fluids into streambeds or causing increased sedimentation if driving through wet crossings. LADWP would be required to inspect vehicles daily for leaks and to report and clean any hazardous fluid spills into waterways. Human presence could result in increased predator presence in the Project area, particularly if food trash is not properly contained, resulting in possible injuries or mortalities to individuals that may emerge from aestivation during construction. Mitigation measures BIO-24 (Protect arroyo toad and California red-legged frog) requires that a qualified biological monitor will ensure that daily efforts are made to eliminate or secure all trash on or near all work sites and roads. All trash receptacles will be fitted with animal- and weather-proof lids. However, based on known occurrences and protocol surveys conducted in 2008 and 2009, this species is unlikely to occur within or near the proposed ROW.

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail above for arroyo toad impacts in the preceding section. The only difference from the new 230 kV transmission line with respect to reconductoring is Segment K, and no arroyo toad habitat or known occurrence have been documented along this segment; therefore, impacts to this species resulting from this Project component are not anticipated.

New 230 kV Circuit – The addition of the 230 kV circuit and its existing access roads do not cross potential habitat for the arroyo toad. No arroyo toads have been documented along the 230 kV line. Designated critical habitat is located within Castaic Creek just northeast of the Castaic Power Plant in an area known as Unit 6: Upper Santa Clara River Basin (50 CFR part 17). The Project would not span over this area, and access roads would not cross this area. The boundaries of Unit 6 extend to within 0.16 mile from the proposed new 230 kV circuit ROW. Unit 6 is also upstream from the proposed new 230 kV circuit ROW. There may be indirect construction effects to arroyo toad, as a breeding population in Castaic Creek, which is just northeast of where the new 230 kV circuit route ends at Castaic Power Plant, is present. Because adult anurans are known to be active nocturnally and not usually diurnally, it is unlikely that any toads would be present on the surface during construction, which will be restricted to daylight hours. Toads may be aestivating within the construction area, but this is unlikely given that observations have shown that inland populations of arroyo toads are more likely to aestivate directly within the streambed rather than dispersing into distant upland habitat (Ramirez 2007). Because of this, it is also expected that construction noise and vibrations would have little to no effect on aestivating arroyo toads in the general area. Habitat loss would not occur where this population is, since construction would not enter the area of occupied habitat in Castaic Creek or critical habitat, which is approximately 0.16 mile from the 230 kV Circuit ROW.

Indirect impacts may occur as a result from sedimentation. A watershed analysis was conducted for BRRTP (see the BRRTP Water Resources Technical Report in Volume IV of the EIS/EIR, USFS/BLM/LADWP 2011, for details on how this analysis was conducted). The new 230 kV circuit would affect the Middle Castaic Creek and Lower Castaic Creek subwatersheds with a combined area of 42,212 acres. Estimated average baseline annual erosion for these subwatersheds is 48.55 tons/acre/year. With construction of the new 230 kV circuit, predicted average annual erosion would be 49 tons/acre/year, an increase of 0.95 percent over baseline. The ground disturbance activities could potentially alter drainage patterns within the work areas and result in soil erosion, leading to increased sedimentation. However, with the implementation of mitigation measures HYD-01 and HYD-02 the potential impacts (less than 1% over baseline) resulting from substantial drainage pattern alteration is considered less than significant for CEQA.

South of the Castaic Reservoir along the 230 kV circuit marginal habitat was identified within Charlie Canyon; due to its marginal quality, lack of water, and jurisdiction outside of the ANF, this area was not surveyed. This habitat may be driven through for construction access to tower sites on the northern side of the canyon. It is unlikely that habitat in the streambed would be directly affected beyond changes in the microhabitat resulting from equipment driving through the streambed crossings. If water is present, this would result in increased sedimentation and changes in hydrology. Based on the habitat assessment and known USFWS habitat locations, arroyo toads are not expected to be present in this area.

Barren Ridge Switching Station Expansion – The Barren Ridge Switching Station expansion would be entirely within the desert habitat, and no arroyo toad habitat or individuals have been documented within the site. A habitat assessment was conducted in 2008 to verify the vegetation community present within in the Barren Ridge Switching Station expansion footprint (POWER 2010); therefore, impacts to this species resulting from this Project component are not anticipated.

New Haskell Canyon Switching Station – The proposed Haskell Canyon Switching Station site is not within potential habitat for arroyo toads. Indirect impacts could occur from introduction of non-native plants to surrounding riparian habitat, and BIO-2 (Prevent the spread of invasive weeds) would be implemented to reduce the likelihood of this occurring. However, the switching station would have no effect on the arroyo toad or its designated critical habitat.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to arroyo toads. Temporary increased human presence, noise, and dust may occur and are considered to be negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and the incorporation of riparian area avoidance and permit measures (BIO-3). Construction crews will also avoid impacting the streambeds and banks of any streams along the route, including access roads, to the extent feasible. When construction or maintenance work affects the bed, bank or margins of a stream under CDFG jurisdiction, LADWP will notify CDFG as required under Fish and Game Code Section 1602, which may include securing a Streambed Alteration Agreement (GP -74).

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on amphibian species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. Herbicides can be particularly harmful to amphibian species, which have semi-permeable skin that readily absorbs both terrestrial and aquatic toxic compounds. Previous research by Relyea (2005) has indicated that POEA surfactants may be highly lethal to amphibians. Surfactants are additives to herbicides that can improve herbicide effectiveness by increasing the spreading and sticking properties of the herbicide on plant surfaces and by reducing the water's surface tension and allowing for greater movement of the herbicide through plants' cuticles (the barrier that normally prevents water loss from the plants) (Miller and Westra 1998). Relyea (2005) found that direct spray of glyphosate with POEA surfactants to both aquatic (tadpole) and terrestrial (juvenile) phases of different species of anurans resulted in 98% mortality of aquatic subjects after three weeks and 79% mortality of terrestrial subjects after one day. However, glyphosate without a POEA surfactant has been demonstrated to be of relatively low toxicity to amphibians (Relyea 2005). Conclusive data for the effects to amphibians from many other herbicides is lacking. To reduce adverse impacts of herbicide application to amphibian species such as the arroyo toad, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicides would only be used with the least toxic surfactant available, would not be applied within 24 hours of a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, would not be sprayed if wind speeds exceed six mph, and would not be applied within a five- to 70-foot buffer—to be determined by an authorized biologist—of any known arroyo toad occurrences.

Summary – Indirect impacts may occur to arroyo toads as a result of this Project and its construction. Some of these effects may be avoidable due to the expectation that arroyo toads will not be present within work areas based on their known occurrences and survey results (POWER 2010). In addition to the three years of protocol surveys conducted within the Project area, preconstruction surveys, timing limitations, and avoidance mitigations would further reduce potential impacts to the arroyo toad.

No impacts to the arroyo toad proposed critical habitat are anticipated. The existing transmission line that would be strung with a new 230 kV conductor is not within the boundaries of the final designated critical habitat.

General practices that would reduce short-term and long-term effects to arroyo toad and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo toad and its habitat include AIR-2a (Implement construction fugitive dust control plan), HYD-01 (Use of Existing Water Crossings). HYD-02 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-24 (Protect arroyo toad and California red-legged frog).

Effect Determination

Based on the analysis provided, the BRRTP **may affect, but is not likely to adversely affect**, the arroyo toad.

7.1.5 Fish

Unarmored Threespine Stickleback

Mitigation Measures for Effects to Unarmored Threespine Stickleback

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 5 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 5 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 5 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require an authorized biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 5 for the full text of this mitigation measure)

Effects to Unarmored Threespine Stickleback

New 230 kV Transmission Line – No direct impacts are expected to occur to unarmored threespine stickleback, which is not expected to occur within the proposed new 230 kV transmission line corridor. Indirect impacts to unarmored threespine stickleback could include habitat degradation in the habitat located just downstream of where the transmission line would cross into San Francisquito Canyon. This could occur due to runoff from Project equipment passing over stream crossings just upstream of the habitat. Additionally, Project equipment and vehicles could carry non-native plant seeds in their tires or on their carriages, potentially resulting in the spread of non-native plant species if the seeds fall off and propagate in new areas. LADWP would be required to prepare and implement a noxious weed control plan to reduce the spread of noxious weeds within the Project area. However, the habitat is no longer expected to be inhabited by the unarmored threespine stickleback due to flooding and fires in the early 2000s (75 FR 28636 28642, CDFG 2011a).

Reconductoring – Reconductoring would occur along Segments A, B, G, and K. Segments A, B, and G are analyzed in detail for unarmored threespine stickleback impacts in the preceding section. The only difference from the new 230 kV transmission line with respect to reconductoring is Segment K, where this species is likely to occur due to numerous sightings within the Santa Clara River (CDFG 2011a). While this species has not been recorded elsewhere along the corridor length, any vehicular crossings through streambeds by vehicles checking reconductoring success at each tower would possibly affect stickleback habitat. If the areas are wet at the time of reconductoring, this could result in sediment deposition and hydrological changes from vehicle tires; if streambeds are dry, then it would likely result in slight changes to the streambed substrate, but notably less than when wet. To analyze this sediment deposition, a watershed analysis was conducted for BRRTP (see the BRRTP Water Resources Technical Report in Volume IV of the EIS/EIR, USFS/BLM/LADWP 2011, for details on how this analysis was conducted). The reconductoring would affect the Sand Canyon-Santa Clara River subwatershed, which has a combined area of 38,533 acres. Estimated average baseline annual erosion for this subwatershed is 47.69 tons/acre/year. With construction of the reconductoring along Segment K, predicted average annual erosion would be 47.75 tons/acre/year, an increase of 0.11 percent increase over baseline. The ground disturbance activities could potentially alter drainage patterns within the work areas and result in soil erosion leading to increased sedimentation. However, with the implementation of mitigation measures HYD-01 and HYD-02 (Table 4.3.3-1), the potential impacts (less than 1% over baseline) resulting from substantial drainage pattern alteration would be considered less than significant for CEQA.

New 230 kV Circuit – No unarmored threespine stickleback habitat or individuals have been documented along this corridor; therefore, impacts to this species resulting from this Project component are not anticipated.

Barren Ridge Switching Station Expansion – Proposed upgrades to the Barren Ridge Switching Station would occur entirely within Mojave Creosote Bush Scrub habitat. No known habitat or occurrences have been documented for the unarmored threespine stickleback; therefore, impacts to this species resulting from this Project component are not anticipated.

New Haskell Canyon Switching Station – No known unarmored threespine stickleback habitat or individuals have been documented in the vicinity of the proposed Haskell Canyon Switching Station or its associated access roads; therefore, impacts to this species resulting from this Project component are not anticipated.

Operation and Maintenance – Operation and maintenance of the proposed transmission lines and substations would pose minimal threat to the unarmored threespine stickleback. Ground and air monitoring of the lines would not impact potential habitat along the San Francisquito Creek. Temporary increased dust may occur and result in negligible impacts. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and the incorporation of riparian area avoidance and permit measures (BIO-3). Construction crews will also avoid impacting the streambeds and banks of any streams along the route, including access roads, to the extent feasible. When construction or maintenance work affects the bed, bank or margins of a stream under CDFG jurisdiction, LADWP will notify CDFG as required under Fish and Game Code Section 1602, which may include securing a Streambed Alteration Agreement (GP -74).

Herbicides are expected to be used to control the spread of non-native weed species. The types of herbicides that may be used for BRRTP and their potential effects on fish species are described above in the Herbicide Applications section of Section 7.1.1, as well as summarized in Table 8. As described in Table 8, most of the herbicides that are proposed for potential use for BRRTP noxious weed control are believed to be of relatively low toxicity to fish. However, some herbicides could have more adverse effects. For example, glyphosate may cause some histological changes to gills, kidneys, and/or the liver of some fish species (SERA 2011a), whereas triclopyr has been shown to cause decreases in fish body length in large doses and lethargic behavior in small doses (SERA 2011b). Studies have indicated that POEA surfactants, sometimes used in glyphosate, can have much more adverse effects to fish than other surfactants (SERA 2011a). Surfactants are additives to herbicides that can improve herbicide effectiveness by increasing the spreading and sticking properties of the herbicide on plant surfaces and by reducing the water's surface tension and allowing for greater movement of the herbicide through plants' cuticles (the barrier that normally prevents water loss from the plants) (Miller and Westra 1998). POEA surfactants in glyphosate appear to be increasingly toxic to fish with increasing toxicity of water (SERA 2011a). To reduce adverse impacts of herbicide application to fish species such as the unarmored threespine stickleback, herbicide application would conform to the standards described in Mitigation Measure BIO-2 (Prevent the spread of invasive weeds). To this end, herbicides would only be used with the least toxic surfactant available, would not be applied within 24 hours of a rain event with 70% or greater chance of occurring, would not be applied within RCAs without USFS approval, would be restricted to only water-safe herbicides and surfactants in riparian areas, would not be sprayed if wind speeds exceed six mph, and would not be applied within a five- to 70-foot buffer—to be determined by an authorized biologist—of any known unarmored threespine stickleback occurrences.

Summary – Unarmored threespine stickleback is not expected to be present within the Project area except possibly in Segment K of the reconductoring corridor. Habitat degradation could occur as a result of vehicular access in areas that are upstream of suitable habitat, although this species is extirpated from sections of San Francisquito Creek where it had been previously documented (CDFG 2011a). Avoidance and minimization measures would be enforced during construction to reduce potential impacts to the unarmored threespine stickleback habitat near construction areas. Suitable habitat for the unarmored threespine stickleback is located immediately south of where the Proposed Action would cross San Francisquito Creek. It is possible that this habitat may be affected by runoff from construction where construction is near slopes or where vehicles drive near the streambed. Avoidance and minimization measures would be enforced during construction to protect and minimize any impacts to this proposed critical habitat.

General practices that would reduce short-term and long-term effects to unarmored threespine stickleback and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to unarmored threespine stickleback and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

Effects Determination

Based on the analysis provided, the BRRTP **may affect, but is not likely to adversely affect**, the unarmored threespine stickleback.

8.0 CUMULATIVE EFFECTS

Cumulative effects would result from incremental impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future actions within the designated region of influence. The term "cumulative effects" means those effects on the species caused by other projects and activities unrelated to the action under consultation. Cumulative effects for biological resources apply to both plant and wildlife species and must take into account known distribution, availability of preferred habitat, designated critical habitat, local population size, and likely responses to effects for each species that is considered.

8.1 IMPACT AREA

The region of influence for BRRTP's biological cumulative effects is defined as any small project within five miles of the proposed segments, as well as any large projects in BRRTP's vicinity (e.g., solar development, wind development) that are farther than five miles from its Project area. This five-mile boundary is assumed to account for impacts to most plants' dispersion area and most animals' migration corridors or individual home ranges. In the case of the California condor, which will often fly very long distances while foraging, a twenty-mile region of influence was implemented.

8.2 PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS

Numerous wind and solar generation projects are in various stages of planning and development within the Project vicinity. Additionally there is a pipeline relocation project in the ANF, a new master planned community on Tejon Ranch, various maintenance and land management projects within the ANF in the Project vicinity, and numerous local projects in Kern and Los Angeles Counties. However, most of these projects are considered to have a federal nexus and are therefore excluded from BA analysis. Below are brief descriptions of projects that are reasonably expected to occur.

Local Projects

Los Angeles County

At the time of writing, the project below is the only reasonably foreseeable non-federal project in Los Angeles County within five miles of the BRRTP that would have potential biological impacts. Because not every project has a formal name, the project below is listed by its case number. Available documentation for the project can be obtained from the LA County Department of Regional Planning website by using the case number (LA County Department of Regional Planning 2011).

Case TR066202 – The proposed project involves the construction of 31 new detached single-family condominiums on a 7.61-acre area. This project may affect nesting habitat for native bird species in the area, and the coastal California gnatcatcher is unlikely to occur on-site. The final determination of the Initial Study called for a Mitigated Negative Declaration.

Kern County

At the time of writing, there are only two known non-federal development projects within five miles of the BRRTP that are reasonably certain to occur and that would potentially have biological impacts. One of these is a church, located in Mojave in an area south of the airport, on Highway 58 at Lone Butte Road. The second involves the addition of a 3,000-square foot assembly hall at an existing cemetery approximately four miles southwest of Willow Springs. These projects did not have names or case numbers. Specific project inquiries can be directed to the Kern County Planning and Community Development Department (2009).

8.3 DIRECT AND INDIRECT IMPACTS SUMMARY

Both direct and indirect impacts are expected to occur to vegetation and wildlife. Direct impacts are defined as those that occur at the same time and place as BRRTP or the surrounding projects mentioned in Section 6.2. Indirect impacts are defined as those which could be caused by BRRTP or surrounding projects, but which would occur at a later time or occur at a distance farther removed from the direct construction corridor. While all of the direct and indirect impacts below could possibly occur due to BRRTP, not all may necessarily apply to each project listed in Section 6.2. However, any common direct or indirect impacts between BRRTP and any of the above-listed projects would exert cumulative effects of varying degrees on certain species or groups of species.

Direct Impacts

- Habitat loss, fragmentation, or degradation (short-term and long-term);
- Direct injury or mortality;
- Disturbance of special-status plants or animals (dust deposition on or crushing of plants, disturbance of an animal's daily activities or natural history); and
- Dispersal of local wildlife (including mortality of young for nesting wildlife).

Indirect Impacts

- Habitat degradation (spread of non-native plant species, soil compaction);
- Indirect injury or mortality (dispersal leading to increased predation risk and/or competition, ingestion of construction debris);
- Disturbance of special-status plants (loss of plant vigor due to dust or mud deposition);
- Reduction in water quality due to insufficient erosion control; and
- Avian collisions and/or electrocutions.

8.4 CUMULATIVE EFFECTS EVALUATION

Cumulative effects are evaluated below for each listed species that may be affected by BRRTP and surrounding projects. Cumulative effects include the effects of future State, tribal, or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the Proposed Action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

Listed or Candidate Plant Species – There are four federal listed or candidate plant species that could occur within the Project area based on their habitat preferences, known ranges, and proximity of existing populations: Braunton's milk-vetch (*Astragalus brauntonii*; Endangered), Nevin's barberry (*Berberis* *nevinii*; Endangered), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; Candidate), and slender-horned spineflower (*Dodecahema leptoceras*; Endangered). Proposed condominium construction in Mint Canyon is in the vicinity of a historical (1937) slender-horned spineflower record that is also possibly extirpated (LA County Department of Regional Planning 2011, case TR066202). However, according to the CNDDB, this canyon has not been sufficiently surveyed and this species may remain extant in its northern end (CDFG 2011a). This species was not identified as a concern for the project's construction, but could affect habitat should there still be suitable habitat on-site. No other known projects in the BRRTP vicinity specifically mention potential impacts to the four aforementioned listed or candidate species. Cumulative effects on listed or candidate plant species between BRRTP and future non-federal projects would not be significant.

California Condor (*Gymnogyps californianus*) – The State and federal Endangered California condor is known to be present along what is known as BRRTP Segment K (part of the 230 kV reconductoring area) and has been known to fly over the project area at lesser frequency. GPS data is also available in the areas near to and north of the new 230 kV circuit. Based on this data supplied by the USFWS (2008b, 2009b), California condors are not expected to be nesting in the Project corridors and likely nest away from the proposed corridors. They may, however, use areas within the Project vicinity for foraging. Historical threats to California condor populations and individuals have included poisoning (lead, cyanide, and copper), DDT and DDE leading to thinned eggshells, and power line collisions (USFWS 1996). There are no known non-federal future projects within five miles of the BRRTP that would impact this species. Cumulative effects on California condor between BRRTP and future non-federal projects in its vicinity would not be significant.

Coastal California Gnatcatcher (*Polioptila californica californica*) – The federal Threatened coastal California gnatcatcher is known to be present on BRRTP's Segment K (part of the 230 kV reconductoring area) and in habitat patches adjacent to the new 230 kV circuit. A proposed condominium construction in Mint Canyon contains "nesting habitat for native birds," but is not specific as to what habitat is present (LA County Department of Regional Planning 2011, case TR066202). According to the Initial Study, the coastal California gnatcatcher is unlikely to be on-site, although it is unclear whether this also means there is no habitat for it. Any habitat that may be present may project a cumulative result on this species with the habitat that will be disturbed from the BRRTP's construction. There are no other known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on coastal California gnatcatcher between BRRTP and future non-federal projects in its vicinity would not be significant.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) – The State and federal Endangered southwestern willow flycatcher is not known to occur within the project area, although willow flycatchers of an undetermined subspecies have been identified on what is known as Segment G of the new 230 kV transmission line. Other suitable habitat was identified on Segment G of the proposed project during 2008 and 2009 surveys. It has also been observed as a migrant species around Bouquet Canyon, but it is unknown whether any breeding populations are present (Aspen 2006). Willow flycatchers have been observed in San Francisquito Canyon in surveys by Tierra Madre Consultants and PCR Services Corporation, but these were not identifiable to subspecies (Tierra Madre Consultants 1999, PCR Services Corporation 2001). Suitable habitat was identified in the Project area during 2008 surveys along the Proposed Action proposed corridor. Historical and current human disturbance, including recreation, development, infrastructure construction, channelization, grazing, nonnative plant proliferation (particularly from tamarisk), and water diversion and impoundment has contributed to the reduction and degradation of riparian habitat in Southern California.

Proposed condominium construction in Mint Canyon contains "nesting habitat for native birds," but is not specific as to what habitat is present and whether the area may support habitat suitable for the southwestern willow flycatcher (LA County Department of Regional Planning 2011, case TR066202).

There are no other known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on southwestern willow flycatcher between BRRTP and future non-federal projects in its vicinity would not be significant.

Least Bell's Vireo (*Vireo bellii pusillus*) – The State and federal Endangered least Bell's vireo is known to be present near the new 230 kV circuit near Castaic Lake and Castaic Lagoon and may also occur on the new 230 kV transmission line in areas of suitable habitat that were identified in 2008 surveys along the Proposed Action proposed corridor. Historical threats to the least Bell's vireo have included urbanization, grazing, agriculture, and proliferation of nonnative plants (USFWS 2006). As urbanization has increased and brought more humans into contact with riparian areas, livestock grazing and agriculture have decreased as these lands are converted and developed. While efforts have been underway to reduce the presence of giant reed (*Arundo donax*) within riparian areas, other exotic species such as tamarisk (*Tamarix* sp.) and perennial pepperweed (*Lepidium latifolium*) remain of concern. Future construction, maintenance, and public recreation in suitable habitat in the vicinity of BRRTP may negatively impact the habitat and/or individuals of this species if present.

Proposed condominium construction in Mint Canyon contains "nesting habitat for native birds," but is not specific as to what habitat is present and whether the area may support habitat suitable for the least Bell's vireo (LA County Department of Regional Planning 2011, case TR066202). Any future construction, maintenance, public recreation, and streambed alteration in suitable habitat in the vicinity of BRRTP may negatively impact the habitat and/or individuals of this species if present. There are no other known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on least Bell's vireo between BRRTP and future non-federal projects in its vicinity would not be significant.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) – The State Endangered, federal Candidate western yellow-billed cuckoo is not known to occur within the BRRTP area, although suitable habitat was identified in the Project area during 2008 surveys along the new 230 kV transmission line proposed corridor. Historical and current human disturbance, including recreation, development, and infrastructure construction, has contributed to the reduction and degradation of riparian habitat in southern California. Future construction, maintenance, and public recreation in suitable habitat in the vicinity of BRRTP may negatively impact the habitat and/or individuals of this species if present.

Proposed condominium construction in Mint Canyon contains "nesting habitat for native birds," but is not specific as to what habitat is present and whether the area may support habitat suitable for the western yellow-billed cuckoo (LA County Department of Regional Planning 2011, case TR066202). Any future construction, maintenance, public recreation, and streambed alteration in suitable habitat in the vicinity of BRRTP may negatively impact the habitat and/or individuals of this species if present. There are no other known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on western yellow-billed cuckoo between BRRTP and future non-federal projects in its vicinity would not be significant.

Desert Tortoise (*Gopherus agassizii*) – The State and federal Threatened desert tortoise is known to be present in the northern sections of the new 230 kV transmission line. Two local, non-federal projects that are reasonably certain to occur have been proposed within five miles of the Proposed Action and could affect desert tortoise, including a new church and a new assembly hall at a cemetery (Kern County Planning and Community Development Department 2009). The church is located just over two miles from a 2006 record of a dead desert tortoise (CDFG 2011a), while the nearest recorded CNDDB occurrence of a desert tortoise to the assembly hall is approximately eight miles away but is in an area where DT could occur. The church site is likely very disturbed, as it is located just south of the airport. There are several CNDDB records of desert tortoise along the desert portion of the Proposed Action (CDFG 2011a). Three of these are within the first two northern linear miles of the Project, while the others are located south of Mojave. Tortoises may continue to live in these general areas outside of Mojave, although there may be some impacts to tortoises or their habitat despite the otherwise disturbed and developed nature of areas such as where the proposed church is to be located. Loss of individuals or habitat in these areas will exert a cumulative effect on desert tortoise with the BRRTP by reducing the local population size or removing suitable habitat, also acting cumulatively with various historical transmission, generation, or residential impacts. The intensity of the cumulative effect is increased due to the fact that these projects will be ongoing for several years. Because this species can take up to 20 years to reach sexual maturity and has low reproductive rates (USFWS 2008a), any actions that stress, harm, or kill desert tortoises can be considered significant. Cumulative effects on desert tortoise between BRRTP and future non-federal projects in its vicinity would be significant.

California Red-legged Frog (*Rana draytonii*) – The federal Threatened California red-legged frog is known to occur near the new 230 kV transmission line in San Francisquito Creek in what is known as the St. Francis Dam reach. Direct impacts to individual animals are unlikely due to the distance of the transmission line corridor from the known population and the steep terrain in between. There are currently no known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on California red-legged frog between BRRTP and future non-federal projects in its vicinity would not be significant.

Arroyo Toad (*Anaxyrus californicus*) – The federal Endangered arroyo toad is only known to occur near the new 230 kV circuit, although due to the presence of suitable habitat, it may occur elsewhere in the proposed ROW. There is a known breeding population of arroyo toads located in Castaic Creek north of the northern terminus of the new 230 kV circuit, which ends at Castaic Power Plant. There are currently no known non-federal future projects within five miles of the BRRTP that could affect this species. Cumulative effects on arroyo toad between BRRTP and future non-federal projects in its vicinity would not be significant.

Unarmored Threespine Stickleback (*Gasterosteus aculeatus williamsoni*) – The State and federal Endangered unarmored threespine stickleback has been observed in the last several years in Bouquet Creek, east of the new 230 kV transmission line. There was previously a population in San Francisquito Creek near Segment G, but it has been determined to have been extirpated after 2005 flooding (CDFG 2011a). There are currently no known non-federal future projects within five miles of the BRRTP that would affect this species. Cumulative effects on unarmored threespine stickleback between BRRTP and future non-federal projects in its vicinity would not be significant.

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10.0 ACRONYMS AND ABBREVIATIONS

AC	Alternating Current
ACSS/AW	aluminum conductor steel supported/aluminum-clad steel wire
ACSS/TW/HS	aluminum conductor steel supported/trapezoidal wires/high strength
ANF	Angeles National Forest
APLIC	Avian Power Line Interaction Committee
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practices
BR-RIN	Barren Ridge-Rinaldi Transmission Line
BRRTP	Barren Ridge Renewable Transmission Project
CDFG	California Department of Fish and Game
CDPR	California Department of Pesticide Regulation
CDNPA	California Desert Native Plants Act
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
COM	Construction, Operation, and Maintenance Plan
CSC	California Species of Special Concern
CWA	Clean Water Act
DBH	Diameter at breast height
DEIS	Draft Environmental Impact Statement
EPA	Environmental Protection Agency
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GAP	Gap Analysis Program
GIS	Geographic Information System
GPS	Global Positioning System
kcmil	Thousand circular mil (formerly MCM)
kV	Kilovolt
LADWP	Los Angeles Department of Water and Power
LMP	Land Management Plan
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
mph	Miles per hour
MW	Megawatt
MWh	Megawatt-hour
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act
NERC	North American Electrical Reliability Council
NFS	National Forest System
NFMA	National Forest Land Management Act
NPS	National Park Service
PCA	Pest Control Advisor
PDCI	Pacific Direct Current Intertie
POD	Plan of Development

POEA	Polyethoxylated Tallowamine
POWER	POWER Engineers, Inc.
PP2	Power Plant 2
PRC	Public Resources Code
RCA	Riparian Conservation Area
ROD	Record of Decision (NEPA)
ROW	Right-of-Way
RPS	Renewable Portfolio Standard
SCE	Southern California Edison
SVL	Snout – Vent Length
TRTP	Tehachapi Renewable Transmission Project
RWQCB	Regional Water Quality Control Board
SEA	Significant Ecological Area
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	U.S. Department of Agriculture, Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WEAP	Worker Environmental Awareness Program
WMP	West Mojave Plan

APPENDIX A – NEW 230 KV TRANSMISSION LINE VEGETATION MAPS

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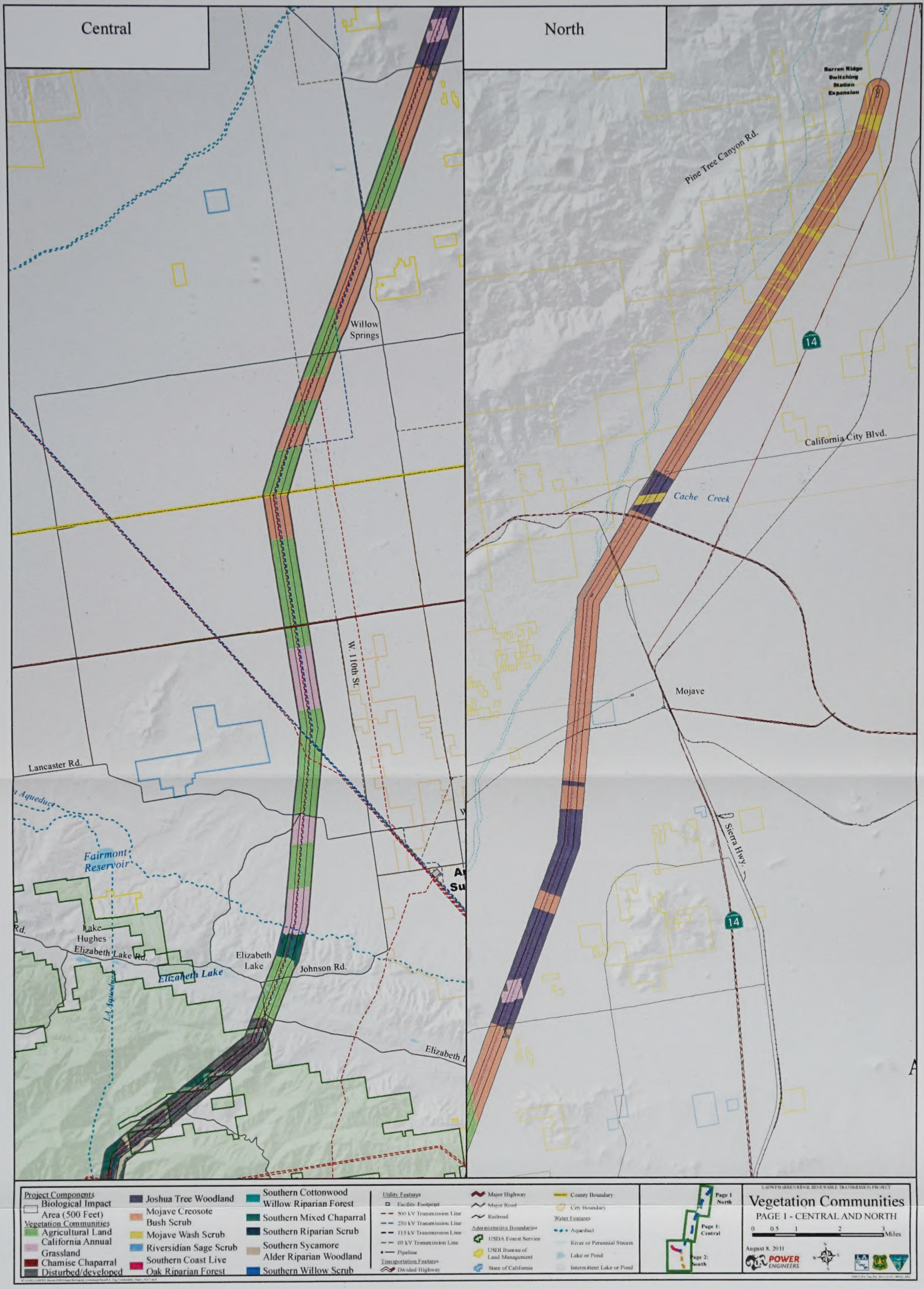
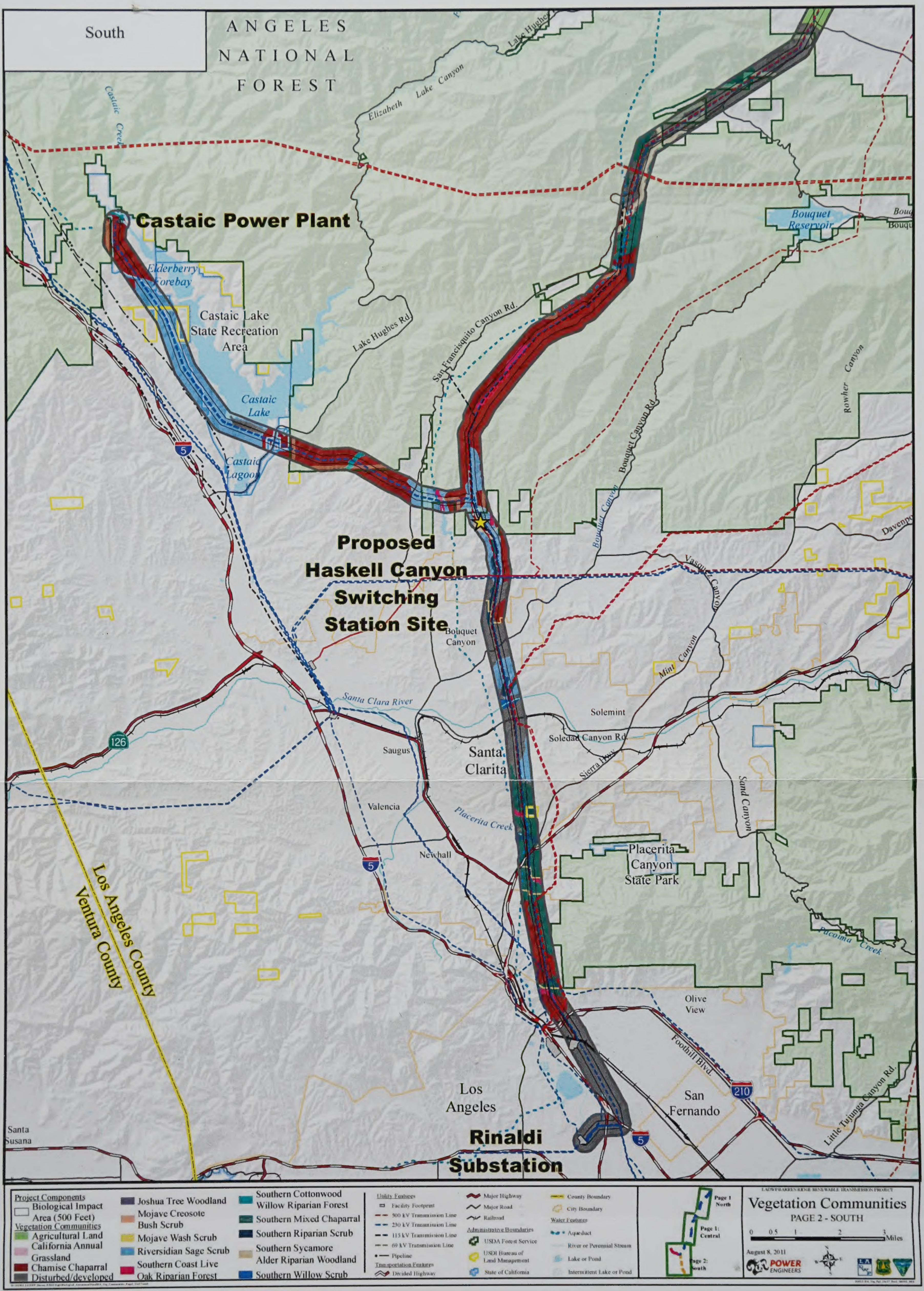
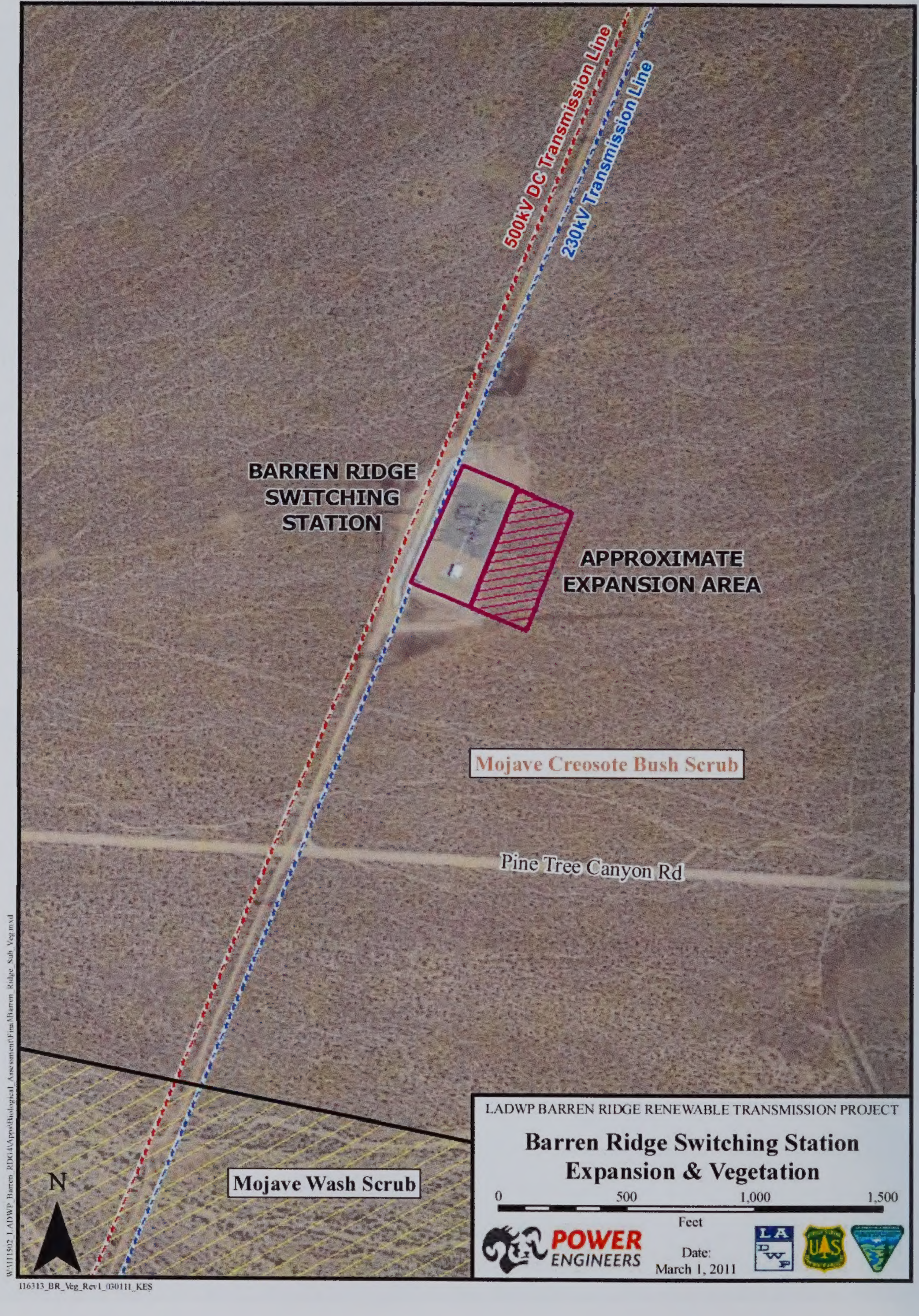

Central
North
Willow Springs
W. 110th St.
Lancaster Rd.
Aqueduct
Fairmont Reservoir
Lake Hughes
Elizabeth Lake Rd.
Elizabeth Lake
Elizabeth Lake
Johnson Rd.
LA Aqueduct
Elizabeth
Rd.
Barren Ridge Switching Station Expansion
Pine Tree Canyon Rd.
14
California City Blvd.
Cache Creek
Mojave
Sierra Hwy.
14
Project Components
Biological Impact Area (500 Feet)
Vegetation Communities
Agricultural Land
California Annual Grassland
Chamise Chaparral
Disturbed/developed
Joshua Tree Woodland
Mojave Creosote Bush Scrub
Mojave Wash Scrub
Riversidian Sage Scrub
Southern Coast Live Oak Riparian Forest
Southern Cottonwood Willow Riparian Forest
Southern Mixed Chaparral
Southern Riparian Scrub
Southern Sycamore Alder Riparian Woodland
Southern Willow Scrub
Utility Features
Facility Footprint
500 kV Transmission Line
230 kV Transmission Line
115 kV Transmission Line
69 kV Transmission Line
Pipeline
Transportation Features
Divided Highway
Major Highway
Major Road
Railroad
Administrative Boundaries
USDA Forest Service
USDI Bureau of Land Management
State of California
County Boundary
City Boundary
Water Features
Aqueduct
River or Perennial Stream
Lake or Pond
Intermittent Lake or Pond
Page 1 North
Page 1: Central
Page 2: South
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
Vegetation Communities
PAGE 1 - CENTRAL AND NORTH
0
0.5
1
2
3
Miles
August 8, 2011
POWER ENGINEERS


South
ANGELES NATIONAL FOREST
Castaic Power Plant
Elderberry Forebay
Castaic Lake State Recreation Area
Castaic Lake
Castaic Lagoon
Castaic Creek
Elizabeth Lake Canyon
Lake Hughes Rd
Lake Hughes Rd
San Francisquito Canyon Rd.
Bouquet Reservoir
Bouquet Canyon Rd
Bouquet Canyon
Rowher Canyon
Davenport
Proposed Haskell Canyon Switching Station Site
Bouquet Canyon
Vasquez Canyon
Mint Canyon
Santa Clara River
126
Solemint
Soledad Canyon Rd
Sierra Hwy
Saugus
Santa Clarita
Valencia
Placerita Creek
Sand Canyon
Placerita Canyon State Park
Newhall
5
Los Angeles County
Ventura County
Pacoima Creek
Olive View
Foothill Blvd.
210
Little Tujunga Canyon Rd.
Los Angeles
San Fernando
Santa Susana
Rinaldi Substation
5
Project Components
Biological Impact Area (500 Feet)
Vegetation Communities
Agricultural Land
California Annual Grassland
Chamise Chaparral
Disturbed/developed
Joshua Tree Woodland
Mojave Creosote Bush Scrub
Mojave Wash Scrub
Riversidian Sage Scrub
Southern Coast Live Oak Riparian Forest
Southern Cottonwood Willow Riparian Forest
Southern Mixed Chaparral
Southern Riparian Scrub
Southern Sycamore Alder Riparian Woodland
Southern Willow Scrub
Utility Features
Facility Footprint
500 kV Transmission Line
230 kV Transmission Line
115 kV Transmission Line
69 kV Transmission Line
Pipeline
Transportation Features
Divided Highway
Major Highway
Major Road
Railroad
Administrative Boundaries
USDA Forest Service
USDI Bureau of Land Management
State of California
County Boundary
City Boundary
Water Features
Aqueduct
River or Perennial Stream
Lake or Pond
Intermittent Lake or Pond
Page 1 North
Page 1: Central
Page 2: South
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
Vegetation Communities
PAGE 2 - SOUTH
0 0.5 1 2 3 Miles
August 8, 2011
POWER ENGINEERS

APPENDIX B – BARREN RIDGE SWITCHING STATION VEGETATION MAP

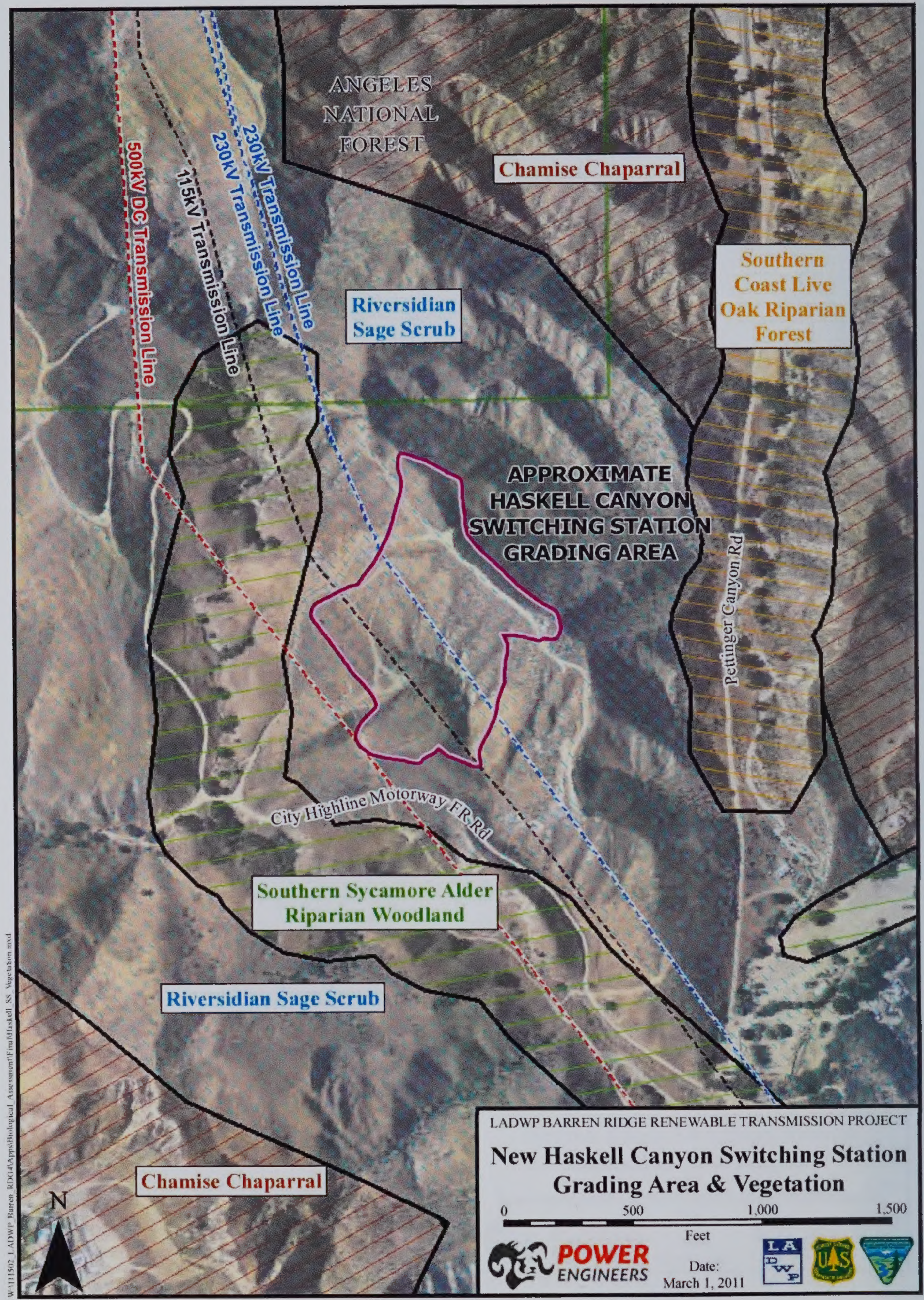


LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Barren Ridge Switching Station Expansion & Vegetation

500kV DC Transmission Line
230kV Transmission Line
BARREN RIDGE SWITCHING STATION
APPROXIMATE EXPANSION AREA
Mojave Creosote Bush Scrub
Pine Tree Canyon Rd
Mojave Wash Scrub
N
0
500
1,000
1,500
Feet
POWER ENGINEERS
Date:
March 1, 2011
LA DWP
W:\111502_LADWP_Barren_RIDGE\Apps\Biological_Assessment\Final\Barren_Ridge_Sub_Veg.mxd
116313_BR_Veg_Rev1_030111_KES

APPENDIX C – HASKELL CANYON SWITCHING STATION VEGETATION MAP



ANGELES NATIONAL FOREST
Chamise Chaparral
500kV DC Transmission Line
115kV Transmission Line
230kV Transmission Line
230kV Transmission Line
Riversidian Sage Scrub
Southern Coast Live Oak Riparian Forest
APPROXIMATE HASKELL CANYON SWITCHING STATION GRADING AREA
Pettinger Canyon Rd
City Highline Motorway FR Rd
Southern Sycamore Alder Riparian Woodland
Riversidian Sage Scrub
Chamise Chaparral
N
0
500
1,000
1,500
Feet
POWER ENGINEERS
LA DWP

LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

New Haskell Canyon Switching Station Grading Area & Vegetation

Date:
March 1, 2011

W:\111502_LADWP_Barren_RDG\4\Apps\Biological_Assessment\Final\Haskell_SS_Vegetation.mxd

116313_HC_Veg_Rev1_030111_KES

APPENDIX D – WILDLIFE RESOURCE PROJECT AREA MAP

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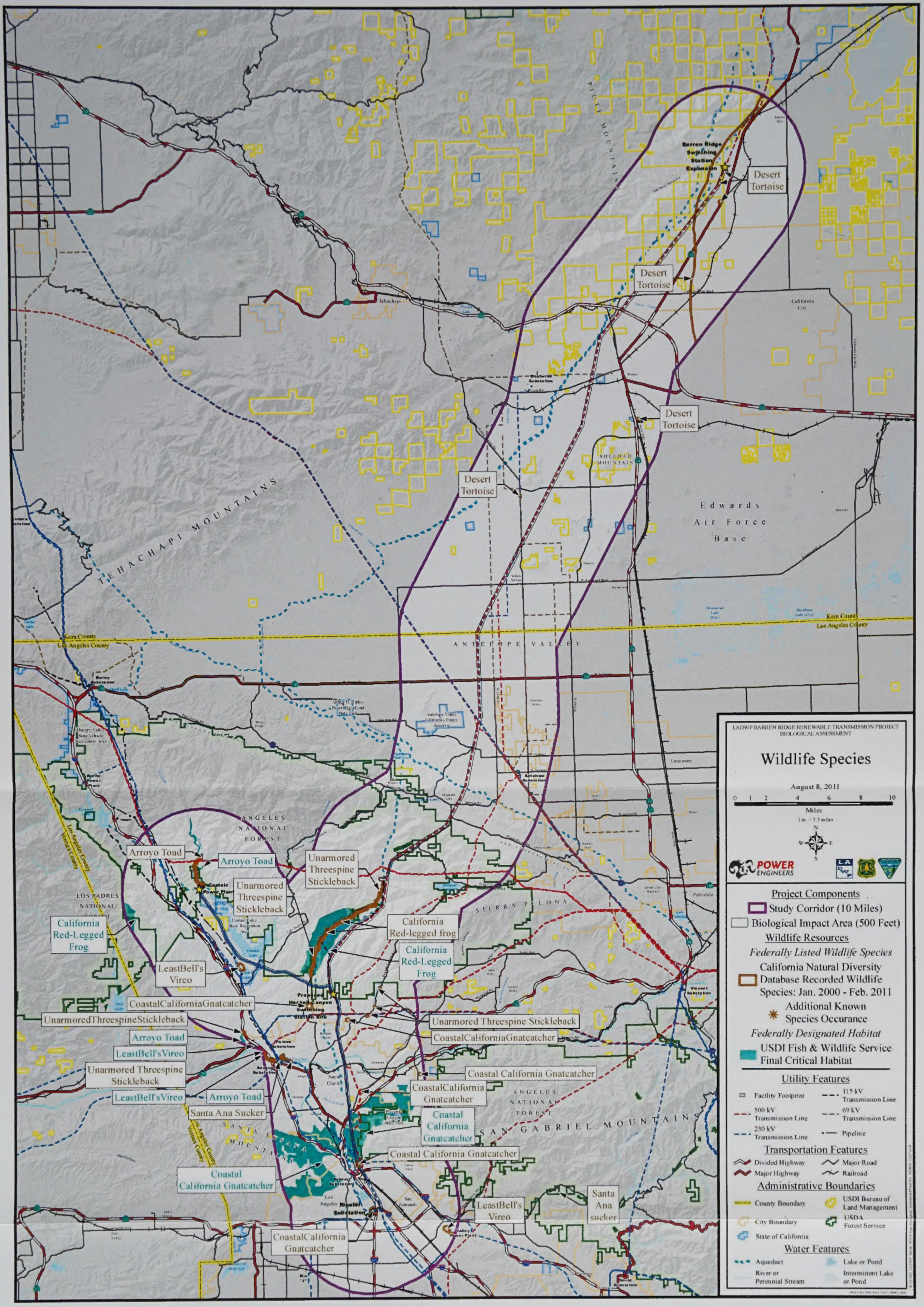
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
BIOLOGICAL ASSESSMENT
Wildlife Species
August 8, 2011
0 1 2 4 6 8 10
Miles
1 in. = 5.5 miles
N
W
E
S
POWER ENGINEERS
Project Components
Study Corridor (10 Miles)
Biological Impact Area (500 Feet)
Wildlife Resources
Federally Listed Wildlife Species
California Natural Diversity Database Recorded Wildlife Species: Jan. 2000 - Feb. 2011
Additional Known Species Occurance
Federally Designated Habitat
USDI Fish & Wildlife Service Final Critical Habitat
Utility Features
Facility Footprint
115 kV Transmission Line
500 kV Transmission Line
69 kV Transmission Line
230 kV Transmission Line
Pipeline
Transportation Features
Divided Highway
Major Road
Major Highway
Railroad
Administrative Boundaries
County Boundary
USDI Bureau of Land Management
City Boundary
USDA Forest Service
State of California
Water Features
Aqueduct
Lake or Pond
River or Perennial Stream
Intermittent Lake or Pond
Barren Ridge Switching Station Expansion
Desert Tortoise
Desert Tortoise
Desert Tortoise
Desert Tortoise
PIUTE MOUNTAINS
Tehachapi
California City
TEHACHAPI MOUNTAINS
SOLEDAD MOUNTAIN
Edwards Air Force Base
Kern County
Los Angeles County
ANTELOPE VALLEY
Antelope Valley California Poppy Reserve
Lancaster
Palmdale
ANGELES NATIONAL FOREST
LOS PADRES NATIONAL FOREST
SIERRA PELONA
Arroyo Toad
Arroyo Toad
Unarmored Threespine Stickleback
Unarmored Threespine Stickleback
California Red-Legged Frog
California Red-legged frog
California Red-Legged Frog
LeastBell's Vireo
CoastalCaliforniaGnatcatcher
UnarmoredThreespineStickleback
Unarmored Threespine Stickleback
CoastalCaliforniaGnatcatcher
Arroyo Toad
LeastBell'sVireo
Coastal California Gnatcatcher
Unarmored Threespine Stickleback
CoastalCalifornia Gnatcatcher
LeastBell'sVireo
Arroyo Toad
Santa Ana Sucker
Coastal California Gnatcatcher
Coastal California Gnatcatcher
Coastal California Gnatcatcher
LeastBell's Vireo
Santa Ana sucker
CoastalCalifornia Gnatcatcher
Proposed Haskell Canyon Switching Station Site
Castaic Power Plant
Santa Clarita
SANTA SUSANA MOUNTAINS
ANGELES NATIONAL FOREST
SAN GABRIEL MOUNTAINS
Rinaldi Substation
Los Angeles County
Ventura County

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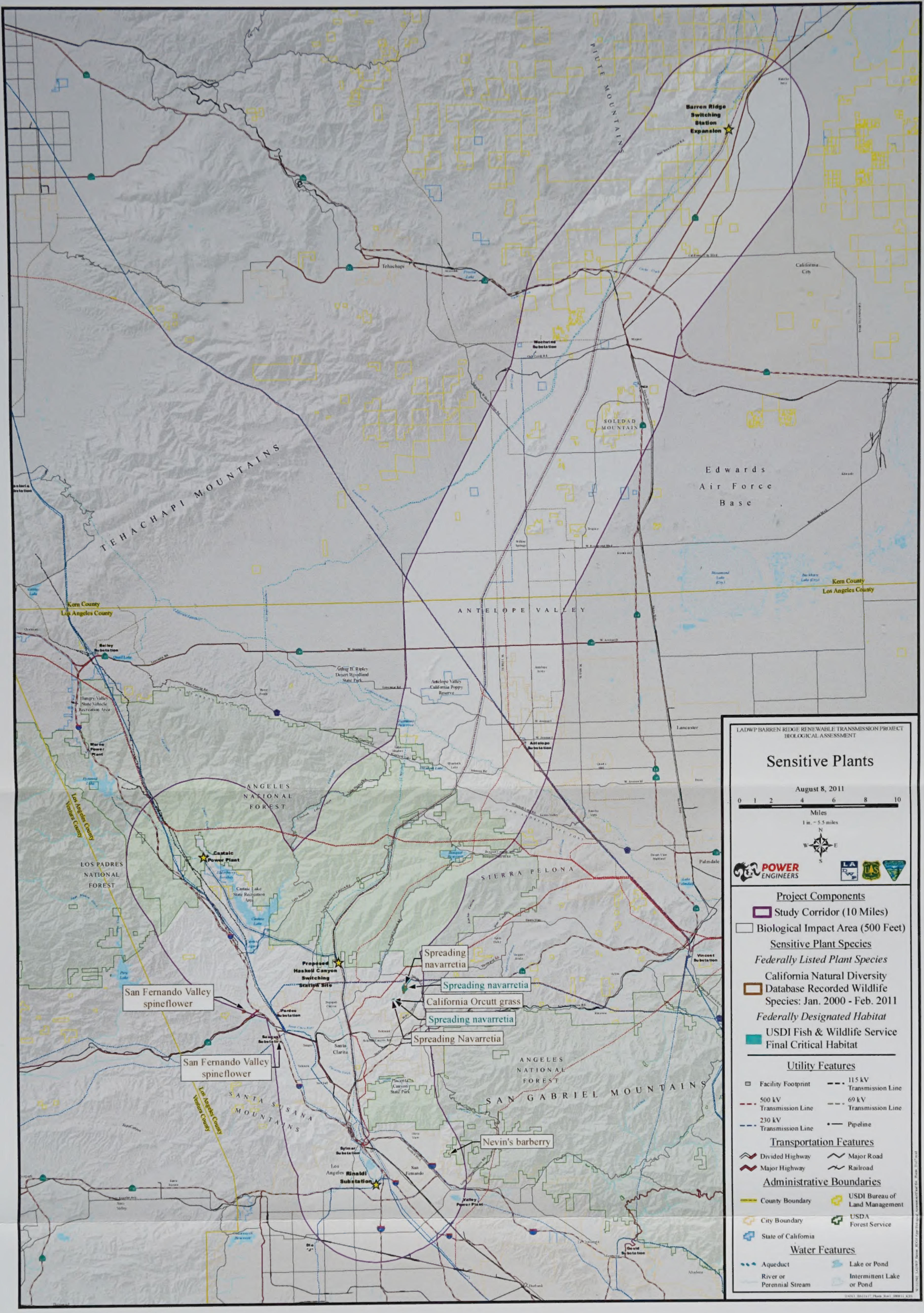
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
BIOLOGICAL ASSESSMENT
Sensitive Plants
August 8, 2011
0 1 2 4 6 8 10
Miles
1 in. = 5.5 miles
N
E
S
W
POWER ENGINEERS
Project Components
Study Corridor (10 Miles)
Biological Impact Area (500 Feet)
Sensitive Plant Species
Federally Listed Plant Species
California Natural Diversity Database Recorded Wildlife Species: Jan. 2000 - Feb. 2011
Federally Designated Habitat
USDI Fish & Wildlife Service Final Critical Habitat
Utility Features
Facility Footprint
115 kV Transmission Line
500 kV Transmission Line
69 kV Transmission Line
230 kV Transmission Line
Pipeline
Transportation Features
Divided Highway
Major Road
Major Highway
Railroad
Administrative Boundaries
County Boundary
USDI Bureau of Land Management
City Boundary
USDA Forest Service
State of California
Water Features
Aqueduct
Lake or Pond
River or Perennial Stream
Intermittent Lake or Pond
PIUTE MOUNTAINS
Barren Ridge Switching Station Expansion
Tehachapi
California City
TEHACHAPI MOUNTAINS
SOLEDAD MOUNTAIN
Edwards Air Force Base
Kern County
Los Angeles County
ANTELOPE VALLEY
Lancaster
Palmdale
ANGELES NATIONAL FOREST
LOS PADRES NATIONAL FOREST
Castaic Power Plant
SIERRA PELONA
Proposed Haskell Canyon Switching Station Site
Spreading navarretia
Spreading navarretia
California Orcutt grass
Spreading navarretia
Spreading Navarretia
San Fernando Valley spineflower
San Fernando Valley spineflower
Los Angeles County
Ventura County
SANTA SUSANA MOUNTAINS
ANGELES NATIONAL FOREST
SAN GABRIEL MOUNTAINS
Nevin's barberry
Rinaldi Substation
Vincent Substation

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APPENDIX F – DETAILED CONSTRUCTION, OPERATION AND MAINTENANCE PROCESS

BRRTP CONSTRUCTION, OPERATION AND MAINTENANCE

1.0 230 KV DOUBLE-CIRCUIT TRANSMISSION LINE

1.1 CONSTRUCTION SEQUENCE

Construction of a transmission line involves the following general sequence of events: surveying the centerline; identifying and constructing access roads; clearing right-of-way and tower sites (including construction yards and batch plants); installing foundations; assembling and erecting the towers; clearing, pulling, tensioning, and splicing sites; installing ground wires and conductors; installing counterpoise; switching station tie in; and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process for the Barren Ridge Renewable Transmission Project (BRRTP). This would require several contractors operating at the same time and in different locations.

The following section describes the construction components necessary for the assembly and installation of the proposed double-circuit transmission line. The description of transmission line construction sequencing and estimates for construction sites would also be relevant for the additional transmission line construction activities associated with the installation of the Castaic-Haskell Canyon #4 circuit on existing structures, and the reconductoring of the Barren Ridge – Rinaldi (BR-RIN) transmission line between the Barren Ridge Switching Station and the Rinaldi Substation.

1.1.1 Surveying Activities

The Los Angeles Department of Water and Power (LADWP) must first obtain survey permits for the portion of the Project crossing federal lands managed by the U.S. Department of Agriculture, Forest Service (USFS) and the U.S. Department of the Interior, Bureau of Land Management (BLM), and rights-of-entry for private lands. This would include the issuance of a 50-year term Special Use Permit to LADWP by the USFS and a 30-year term (renewable) Right-of-Way Grant issued by the BLM. For survey on affected private lands, LADWP would need to negotiate rights-of-entry with the local landowners. Once survey permits are obtained, construction survey work would consist of locating the centerline, tower center hubs, ROW boundaries, and tower access roads, some of which would be located outside of the ROW boundaries. Whenever possible, location of the ROW and Project facilities would be laid out to avoid identified sensitive resources. All of these activities would begin approximately one year prior to the start of construction. Cultural resources and necessary additional threatened and endangered species intensive surveys would be conducted once the survey of the centerline and access roads is completed and clearly marked.

Necessary pre-construction geotechnical investigations would include geological field mapping of each tower site, and borings by drill rig for soil sampling and bedrock corings to determine soil densities and bedrock strength. Test locations would include angle points between the Barren Ridge Switching Station and the Angeles National Forest (ANF), and five to ten locations along the selected alignment within the ANF. Seismic analysis of tower sites for slope stability would also be necessary in mountainous areas of the ANF. Existing roads would be used as much as possible, but some new roads could be required.

1.1.2 Preconstruction Weed Removal

LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. A pre-construction weed inventory shall be conducted by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. In areas subject to ground disturbance, weed infestations shall be treated prior to construction according to control methods and practices for invasive weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated and utilized for eradication and monitoring post construction. Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 24 hours of a scheduled rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed six miles per hour. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands, respectively) with the goal of controlling populations before they start producing seeds.

1.1.3 Construction of Access Roads

The construction, operation, and maintenance of the proposed transmission line would require that heavy vehicles access tower sites along the right-of-way. Where new access roads are required, they would be constructed to support the weight of these vehicles and would typically be 16 feet wide, consisting of a 14-foot driving surface with a side drainage system between one and two feet in width. Permanent roads would be constructed where necessary for operation or maintenance, or where it is required by the landowner or land managing agency. Road standards would be addressed specifically in the Construction, Operation, and Maintenance Plan (COM Plan) and the Plan of Development (POD) during the engineering phase of the Project, and prior to a Notice to Proceed from the USFS and BLM.

Dependent upon final design and mitigation, some temporary access roads may be constructed as part of the Project. These would typically be 16 foot wide roads, but would typically have no improved ditch drainage systems. Most temporary roads would be constructed by crushing vegetation. In some areas, material and topsoil from the temporary roads would be bladed to one or both sides to facilitate rehabilitation. Following construction, bladed material can be re-spread across the disturbed road section. Seeds and roots contained within the re-spread topsoil layer normally provide a natural source for new growth.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads can be used that are located in close proximity to the proposed centerline of the transmission line, only spur roads to the tower sites would be required. New access roads and spur roads would likely be constructed into the right-of-way where existing roads do not exist. Table 1 lists the estimated ground disturbance of access and spur roads based on terrain.

TABLE 1. ACCESS AND SPUR ROAD GROUND DISTURBANCE ESTIMATES

Ground Disturbance Categories	Access Roads		Spur Roads (average width 16 feet)	
	Average Miles of Roads Per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line*	Average Miles of Roads Per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line
1. Existing roads or agricultural land; no widening anticipated	n/a	n/a	0.3	0.6
2. Existing 8 ft wide roads that require an additional 8 ft of widening	1.0 to 2.5	Permanent 0.9 to 2.4	0.3	0.6
3. Construct new road on flat terrain (0-10%)	1.0 to 2.5	Permanent 1.9 to 4.8	0.3	0.6
4. Construct new road on sloping terrain (10-20%)[1]	2.5 to 4.0	Temporary 7.3 to 11.6 Permanent 4.8 to 7.7	0.5	1.0
5. Construct new road on steep terrain (20-30%)[1, 2]	4.0 to 6.0	Temporary 23.3 to 34.9 Permanent 7.7 to 11.6	0.8	1.6
6. Construct road on very steep terrain (greater than 30%)[1, 2]	6.0 to 8.0	Temporary 69.8 to 93.1 Permanent 11.6 to 15.5	1.0	1.9

[1] After construction of the transmission line, all access roads in Categories 4 through 6 would be restored back to 16 feet wide.

[2] On steep terrain (approximately 25% or higher) with limited access on the Angeles National Forest, the USFS may require Helicopter Mitigation.

Wherever possible, roads would be built at right angles to streams and washes. Culverts or other drainage structures would be installed as necessary across drainages, but the roads would usually follow the natural grade. In addition, road construction would include dust-control and erosion control measures in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line without changing their service level. Gates would be installed where required at fenced property lines to restrict general vehicular access from or to the right-of-way. Where identified within the environmental studies for mitigation purposes, access roads may be excluded or limited within specific sensitive areas, such as Riparian Conservation Areas (RCAs) on the Angeles National Forest.

1.1.4 Clearing Right-of-Way

The clearing of some natural vegetation may be required. However, selective clearing would be performed only when necessary to provide for surveying, electrical safety clearances, line reliability, and maintenance. Trimming or removal of mature vegetation, under or near the conductors, would be done to provide adequate electrical clearance as required by the National Electrical Safety Code, the North American Electrical Reliability Corporation, and California Public Utilities Commission General Order 95 standards.

Trees that could fall onto the lines or affect lines during wind-induced line swing would be removed. Normal clearing procedures are to top or remove large trees and not disturb smaller trees. Where there is a direct conflict between trees and clearance standards, the removal of trees would be jointly reviewed and agreed upon between LADWP and the owners or managers of the property. Rights-of-way would not be chemically treated unless necessary to comply with requirements of a permitting agency. On National Forest System (NFS) lands, approved herbicides would be utilized within the Project area on select invasive plant species. Invasive plant surveys and control would continue for the life of the Project.

1.1.5 Tower Site Clearing

After access roads are developed, preparation of individual structure sites would be required to install the structures. At tower locations, work areas of up to 200 feet squared in flat terrain and up to 200 by 250 feet in areas with slopes greater than eight percent may be needed. Within the work areas, at some tower locations, a level cleared area (pad) may be necessary to complete the construction of the towers. However, many tower sites would be considerably smaller depending on the size of the tower, the terrain, resource considerations, and whether helicopter construction was used, among other factors. The work area would be required for the location of tower footings, assembly of the tower, and the necessary crane maneuvers. Vegetation would be mostly crushed, and cleared only when necessary. All pads not needed for normal transmission line maintenance would be graded to blend as near as possible with the natural contours, and revegetated where required by a permitting agency. See Table 2 for tower specifications and Table 5 for estimated temporary and permanent ground disturbance associated with the double-circuit steel lattice towers.

TABLE 2. DOUBLE-CIRCUIT STEEL LATTICE TOWER SPECIFICATIONS

Tower Placement Details	Specifications	
	Categories 1 through 3 Flat (0 – 10% slope)	Categories 4 through 6 Mountainous (10 – 30% slope)
Towers per mile	±5	±5
Average span length	1,100 ft.	1,000 ft.
Average height Ground to lowest attachment	115 ft.	105 ft.
Upper body height	52 ft.	52 ft.
Overall tower height	167 ft.	157 ft.
Typical range of heights of new towers	120 – 195 ft.	110 – 185 ft.

1.1.6 Staging Areas and Batch Plants

It is anticipated that one or two construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located centrally or near each end of the transmission line route. The staging areas would be located on previously disturbed private land and would be level and surfaced with crushed aggregate base. The LADWP would negotiate with landowners for specific locations of the staging areas.

Concrete for use in constructing foundations would be dispensed from a portable concrete batch plant located at approximately 15 mile intervals. A rubber-tired flatbed truck and tractor would be used to relocate each plant along the right-of-way. Commercial ready-mix concrete would be used when access to tower construction sites is economically feasible.

The construction yards and batch plants would be located on private land and serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, and stations for equipment maintenance. Facilities would be fenced and their gates locked. Security guards would be stationed where needed. See Table 3 for estimated ground disturbance associated with the staging sites and batch plants.

TABLE 3. STAGING SITES AND BATCH PLANT GROUND DISTURBANCE ESTIMATES

Disturbance Description	Categories 1 through 3 Flat (0 – 10% slope)*	
	Maximum Estimated Disturbance Dimension per site	Average Disturbance
Material staging sites (2 sites)	400 x 540 ft. (5 acres)	N/A
Concrete batch plants (3 sites maximum)	2 acres, 30 mile haul distance	0.2 acre per mile
Total Average Disturbance	**0.2 acre per mile**	

*Material staging sites and concrete batch plants would not be built on terrain above 10% slope.

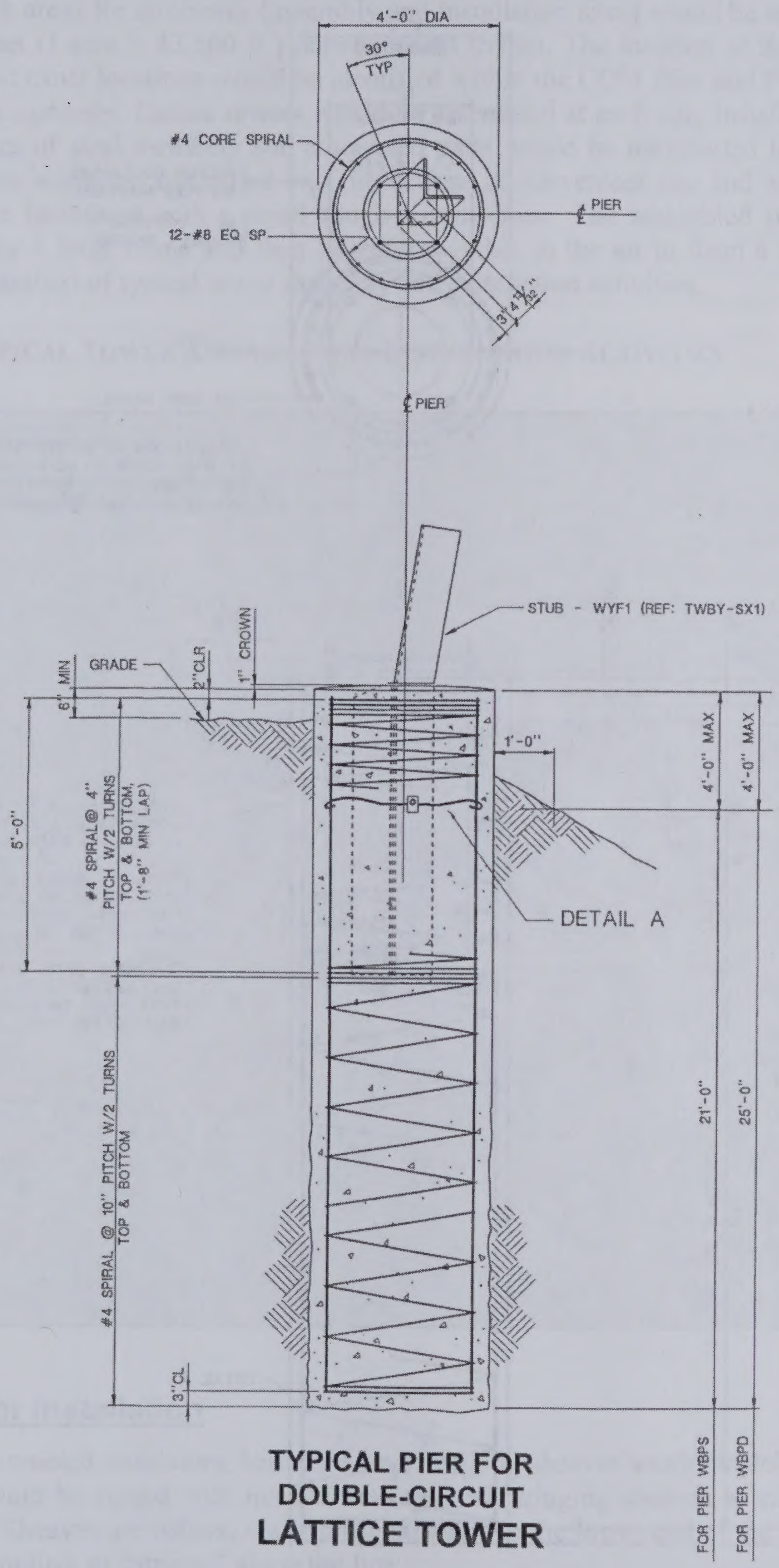
1.1.7 Foundation Installation

Tower foundations for the lattice structures would consist of drilled concrete piers. The foundation process would start with the boring of four holes for each lattice structure or one hole for each TSP. The holes would be bored using truck- or track-mounted excavators with various diameter augers to match diameter and depth requirements of the foundation sizes.

For a typical suspension lattice tower, each hole would typically be four feet in diameter and 25 feet deep, depending on soil conditions. For the larger angle or dead-end structures, foundations could be up to 30 or more feet deep, depending on soil conditions. Each foundation would extend above the ground line between six inches and four feet. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation. Refer to Figure 1 and Figure 2 for typical foundation details for double-circuit towers.

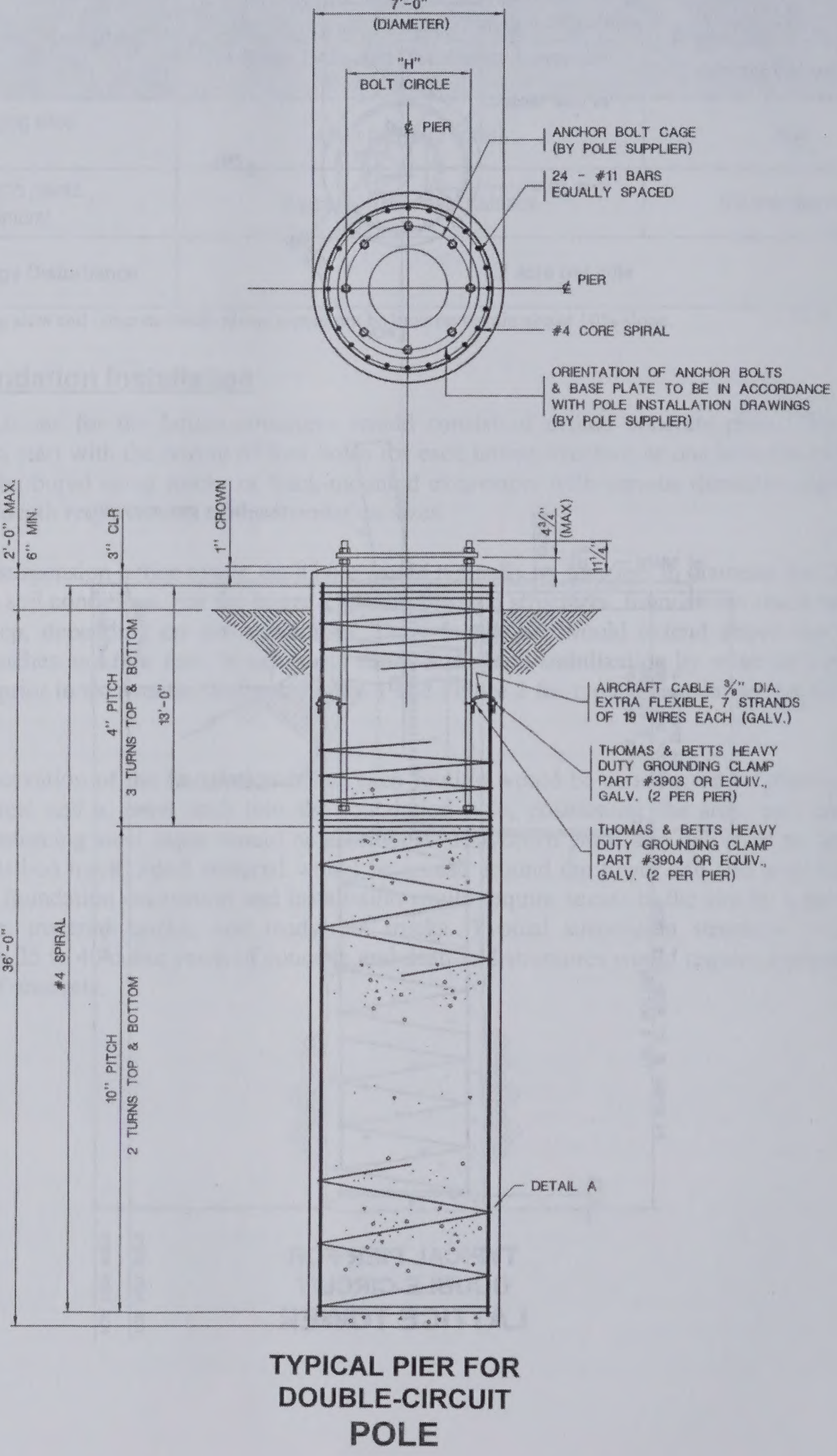
Following excavation of the foundation holes, each footing would be constructed by placing formwork, reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Reinforcing steel cages would be assembled at laydown yards and delivered to each structure location by flatbed truck. Spoil material would be spread around the tower site and used for fill where suitable. The foundation excavation and installation would require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks. Typical suspension structures would require approximately 25 to 40 cubic yards of concrete and dead-end structures would require approximately 120 cubic yards of concrete.

FIGURE 1. TYPICAL FOUNDATION DESIGN FOR THE DOUBLE-CIRCUIT STEEL LATTICE TOWERS


4'-0" DIA
30° TYP
#4 CORE SPIRAL
12-#8 EQ SP
℄ PIER
3"
4 13/32"
℄ PIER
STUB - WYF1 (REF: TWBY-SX1)
GRADE
6" MIN
2" CLR
1" CROWN
1'-0"
5'-0"
#4 SPIRAL @ 4" PITCH W/2 TURNS TOP & BOTTOM, (1'-8" MIN LAP)
DETAIL A
4'-0" MAX
4'-0" MAX
#4 SPIRAL @ 10" PITCH W/2 TURNS TOP & BOTTOM
21'-0"
25'-0"
3" CL
FOR PIER WBPS
FOR PIER WBPD

TYPICAL PIER FOR
DOUBLE-CIRCUIT
LATTICE TOWER

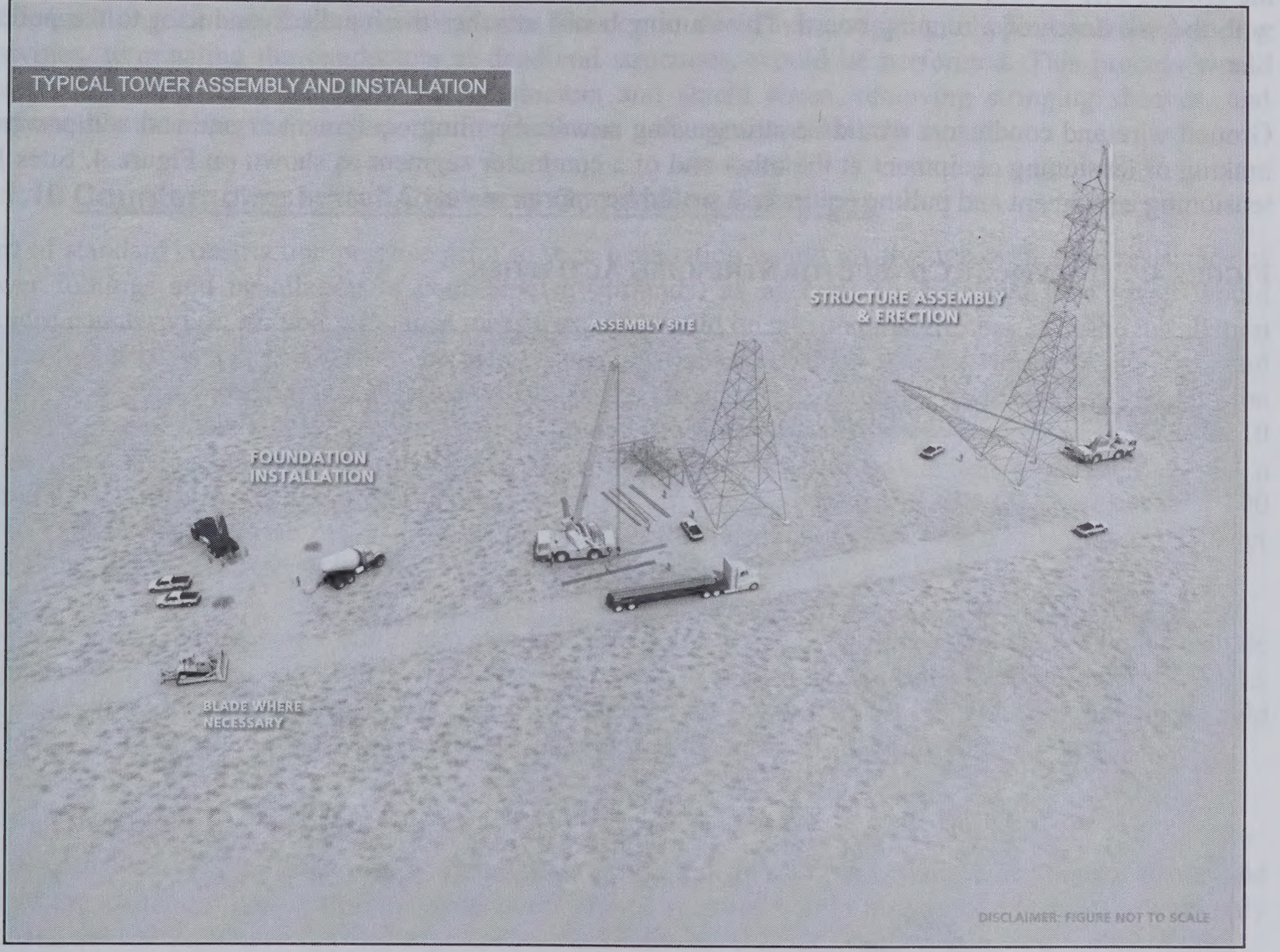
FIGURE 2. TYPICAL FOUNDATION DESIGN FOR TUBULAR STEEL POLES


7'-0" (DIAMETER)
"H" BOLT CIRCLE
℄ PIER
ANCHOR BOLT CAGE (BY POLE SUPPLIER)
24 - #11 BARS EQUALLY SPACED
℄ PIER
#4 CORE SPIRAL
ORIENTATION OF ANCHOR BOLTS & BASE PLATE TO BE IN ACCORDANCE WITH POLE INSTALLATION DRAWINGS (BY POLE SUPPLIER)
2'-0" MAX. 6" MIN.
3" CLR
1" CROWN
4¾" (MAX)
1¼"
AIRCRAFT CABLE ⅜" DIA. EXTRA FLEXIBLE, 7 STRANDS OF 19 WIRES EACH (GALV.)
THOMAS & BETTS HEAVY DUTY GROUNDING CLAMP PART #3903 OR EQUIV., GALV. (2 PER PIER)
THOMAS & BETTS HEAVY DUTY GROUNDING CLAMP PART #3904 OR EQUIV., GALV. (2 PER PIER)
4" PITCH 3 TURNS TOP & BOTTOM
13'-0"
36'-0"
#4 SPIRAL
10" PITCH 2 TURNS TOP & BOTTOM
DETAIL A
TYPICAL PIER FOR DOUBLE-CIRCUIT POLE

1.1.8 Tower Assembly and Installation

The size of the work areas for structures (assembly and installation sites) would be approximately 40,000 to 50,000 square feet (1 acre = 43,560 ft^2) depending on terrain. The location of these sites has not yet been determined, but exact locations would be identified within the COM Plan and POD prior to a Notice to Proceed from the agencies. Lattice towers would be assembled at each site, installed and bolted to the foundations. Bundles of steel members and associated parts would be transported to each tower site by truck. Steel members would be assembled into subsections of convenient size and weight on the ground. Assembly would be facilitated with a small rough-terrain crane. The assembled subsections would be erected into place by a large crane and then fastened together in the air to form a complete tower. See Figure 3 for an illustration of typical tower assembly and installation activities.

FIGURE 3. TYPICAL TOWER ASSEMBLY AND INSTALLATION ACTIVITIES


TYPICAL TOWER ASSEMBLY AND INSTALLATION
STRUCTURE ASSEMBLY & ERECTION
ASSEMBLY SITE
FOUNDATION INSTALLATION
BLADE WHERE NECESSARY
DISCLAIMER: FIGURE NOT TO SCALE

1.1.9 Conductor Installation

After the towers are erected, insulators, hardware, and stringing sheaves would be delivered to each tower site. The towers would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position. Sheaves are rollers, temporarily attached to the lower end of the insulators that allow the conductor to be pulled, or "strung," along the line.

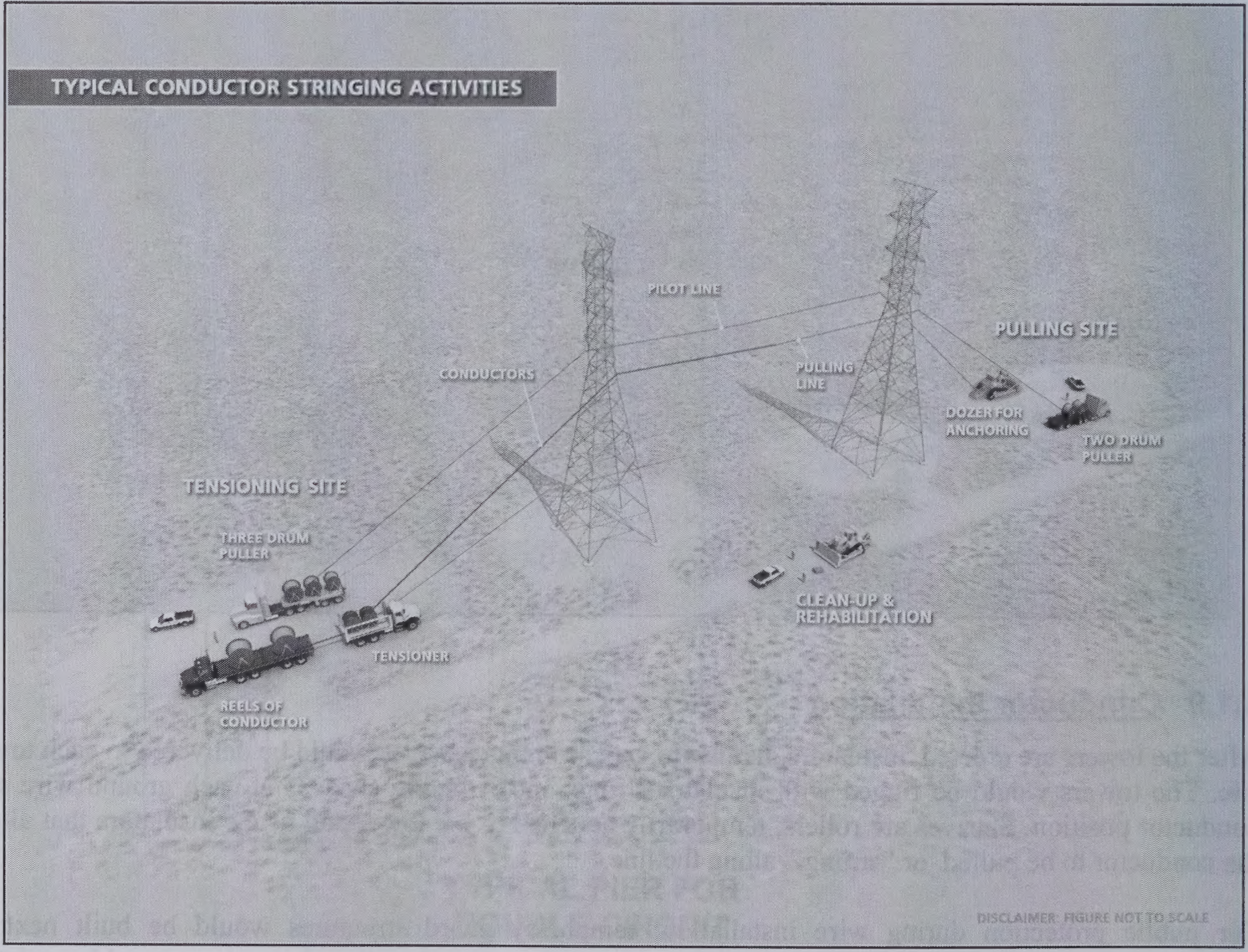
For public protection during wire installation, temporary guard structures would be built next to highways, railroads, power lines, structures, and other major obstacles. Guard structures would consist of

H-frame poles placed on either side of an obstacle. These structures would prevent ground wire, conductor, or equipment from falling on an obstacle. Equipment for installing guard structures would include augers, line trucks, pole trailers, and cranes. A guard structure would be anticipated to be necessary every five miles. The amount of ground disturbance would typically be 200 feet by 300 feet. The guard structures would be left in place until conductors and ground wires were strung, tensioned and clipped; this time frame would be approximately three weeks or longer depending on conditions. Guard structures may not be necessary for small roads. In such cases, other safety measures, such as barriers, flagmen, or other traffic control, would be used.

Pilot lines would be pulled (strung) from tower to tower by a helicopter and threaded through the stringing sheaves at each tower. The pilot line can be used to pull in the ground wire, but is used to pull in a larger-diameter, stronger pulling line for the conductor. The larger-diameter, stronger line—pulling line—would be attached to the conductors to pull them onto towers. This process would be repeated until the ground wire or conductor is pulled through all sheaves. Bundled conductors would be pulled together with the assistance of a running board. The running board attaches the bundled conductor to the pulling line.

Ground wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment as shown on Figure 4. Sites for tensioning equipment and pulling equipment would be approximately 2.5 miles apart.

FIGURE 4. TYPICAL CONDUCTOR STRINGING ACTIVITIES


TYPICAL CONDUCTOR STRINGING ACTIVITIES
PILOT LINE
PULLING SITE
CONDUCTORS
PULLING LINE
DOZER FOR ANCHORING
TWO DRUM PULLER
TENSIONING SITE
THREE DRUM PULLER
CLEAN-UP & REHABILITATION
TENSIONER
REELS OF CONDUCTOR
DISCLAIMER: FIGURE NOT TO SCALE

To the greatest extent practical, pulling and tensioning sites would be located within the transmission ROW. However, some pulling and tensioning sites may occur outside the ROW. The tensioning and pulling sites could be as large as 200 feet by 500 feet, however they would be limited in size depending on each specific location and what is reasonable for safe construction practices. The size of each site would be limited as much as possible and would be designed in coordination with the responsible property owner or land management agency. Depending on topography, some grading may be required at pulling and tensioning sites to create level pads for equipment. Tensioners, line trucks, wire trailers, and tractors needed for stringing and anchoring the ground wire or conductor would be located at the tensioning sites. A puller, line trucks, sag cat and tractors would be needed for pulling and temporarily anchoring the ground wire and conductor. Table 5 includes ground disturbance estimates for conductor installation (helicopter fly yards, portable helicopter landing pads, pulling and stringing sites, and sleeving and stringing operations).

After installing the conductor ground wire or fiber optic shield wire, sagging, clipping and dead-ending activities, terminating the conductors at dead-end structures, would be performed. This process would involve adjusting the position of the conductors and shield wires, removing stringing sheaves, and permanently attaching the conductor to the insulators with specialized hardware.

1.1.10 Counterpoise Installation and Grounding Practices

Part of standard construction practice prior to wire installation would involve measuring the resistance of tower footings and installation of counterpoise (grounds) as needed. To determine if a tower would require counterpoise, ground resistance measurements would be taken at towers sites after the installation of the foundations and structures. The measurements would be evaluated to determine the numbers and locations of structures requiring counterpoise. If the resistance to remote earth for each transmission tower is greater than 10 ohms, counterpoise (grounds) would be installed to lower the resistance to 10 ohms or less. Counterpoise would consist of a bare copper-clad or galvanized steel cable buried a minimum of 12 inches deep, extending horizontally from one or more tower legs for approximately 200 feet. Typical counterpoise installation would include two installations per structure on opposite tower legs. Four installations per tower could be required in certain circumstances.

In addition to counterpoise installation, standard grounding practices during construction would include both temporary and permanent grounding of equipment and structures, such as fences or pipelines, as necessary to reduce any potential magnetically induced voltages to harmless levels. Such practices could include electrical isolation of equipment or structures and the installation of grounding wires.

1.1.11 Switching Station Tie-in

At the proposed Haskell Canyon Switching Station, the transmission lines would be connected into and out of the switching station through dedicated station structures within the switching station, commonly referred to as "bus."

1.2 UPKEEP OF CONSTRUCTION SITES

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the line. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. No open burning of construction trash would occur without agency approval.

Microtrash would be cleaned daily from all work areas within known California condor habitat. Microtrash is a term used to describe small bits of debris like bottle caps, rags, screws, bolts, wires, glass, and other materials found in condor habitat.

1.3 HAZARDOUS MATERIALS WITHIN THE PROJECT AREA

Petroleum products such as gasoline, diesel fuel, helicopter fuel, crankcase oil, lubricants, and cleaning solvents would be present within the Project area during construction. These products would be used to fuel, lubricate, and clean vehicles and equipment. These products would be containerized by fuel trucks or by approved containers. When not in use, hazardous materials would be properly stored to prevent drainage or accidents.

Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment shall be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.

All construction, operation, and maintenance activities would comply with all applicable federal, state, and local laws and regulations regarding the use of hazardous substances.

The construction or maintenance crew foreman would insure that all applicable laws are obeyed. In addition, an on-site inspector would be present during construction to make sure that all hazardous materials are used and stored properly. A health and safety plan would be developed as part of the COM Plan and POD during the engineering and preconstruction phase of the Project.

1.4 SITE RECLAMATION

The ROW, including temporary construction sites, and any temporary ground disturbance outside of the ROW that may have been caused during or due to the construction of the Project (e.g., temporary access roads, staging sites, assembly yards) would be restored as required by the property owner or land management agency. All practical means would be used to restore the land to its original contour and to restore natural drainage patterns along the ROW. Because revegetation would be difficult in many areas of the Project where precipitation is minimal, it would be important to minimize disturbance during construction. All practical means would be used to increase the chances of vegetation reestablishment in disturbed areas.

The total construction period would be approximately two years. The COM Plan that would be completed during the engineering and preconstruction phase of the Project would address specific site reclamation of all disturbed areas.

1.5 FIRE PROTECTION

A Fire Management Plan would be developed for the Project and all applicable fire laws and regulations would be observed during the construction period. All personnel would be advised of their responsibilities under the applicable fire laws and regulations, including taking practical measures to report and suppress fires.

1.6 CONSTRUCTION MONITORING

An approved compliance program would be developed to address mitigation requirements associated with the avoidance of sensitive plant and animal species, cultural sites, or other sensitive features located

within or adjacent to the Project. Prior to construction, these measures will be described in detail and included in the POD.

1.7 THREE-CIRCUIT TOWER MITIGATION

A temporary transmission line would be constructed to keep the BR-RIN circuit energized during construction of the three-circuit towers. After the temporary line is constructed, the existing BR-RIN single-circuit towers would be removed to allow the new three-circuit towers to be constructed within the existing ROW. Once construction of the three-circuit towers is completed, the temporary transmission line would be removed.

The temporary transmission line would be 7.5 miles long and would consist of wood and steel single poles with an average height of 95 feet, a 3-foot by 3-foot footprint, and an average of eight poles per mile. Construction would occur within a temporary 80- to 100-foot ROW. Refer to Table 4 for specifications and to Table 5 for ground disturbance estimates. The majority of the temporary transmission line would be constructed along San Francisquito Road. Portions would also be constructed along Elizabeth Lake Road and Johnson Road. Pole placement would be adjacent to public roadways wherever possible. If necessary, temporary ROW on private property would be needed where poles could not be placed within public road ROW. The majority of poles would be direct-embedded when set in place and would not require a permanent foundation. Where additional strength is necessary at larger angle points, steel poles would be required, which could require an excavation approximately 6 feet in diameter by 20 feet deep to accommodate the concrete pier foundation that would be cast in place. Once all the poles have been constructed and the conductor installed, the existing BR-RIN circuit would be connected into the temporary line and energized. The construction would require establishment of a staging area, work areas around poles, and pull and tension sites. Access to pole sites and pull and tension sites would be from the adjacent roadways.

Approximately seven miles of the existing BR-RIN single-circuit towers would be removed, with existing ROW utilized to access the existing towers. The new three-circuit towers would be placed within the existing ROW, utilizing existing access roads. Helicopter Mitigation, as described in this section below, would be applied in steeper terrain crossing the Angeles National Forest if additional access is required. If additional access roads, considered to be longer than 300 feet, are necessary, specific locations and construction method (either helicopter or conventional) would be coordinated with the USFS. The new three-circuit tower would require a 25-foot by 30-foot structure footprint and an average of seven structures per mile; the average structure height would be 170 feet, with a maximum tower-to-tower span length of 780 feet. Structures would be installed in the same locations as the existing BR-RIN structures within the limits of standard tower design. The construction process for the new three-circuit towers would be the same as the double-circuit towers discussed above. After completion of construction of the three-circuit towers, the temporary transmission line would be removed and all temporary staging and work area land disturbances would be restored as close to previous conditions as possible and revegetated as required. Restoration practices would be consistent with Section 1.11 Decommissioning of Transmission Lines.

TABLE 4. THREE-CIRCUIT TOWER SPECIFICATIONS

Tower Placement Details	Specifications	
	Triple-Circuit	Temporary Transmission Line
ROW acquisition	None (within existing)	80-100 ft
Structures per Mile	7	8
Average span length	750 ft	650 ft

Tower Placement Details	Specifications	
	Triple-Circuit	**Temporary Transmission Line**
Average height (ft)		
Ground to lowest attachment	120	60
Upper body height	50	45
Overall tower height	170	105
Typical range of heights of new towers	150 - 180 ft.	95 - 105 ft.

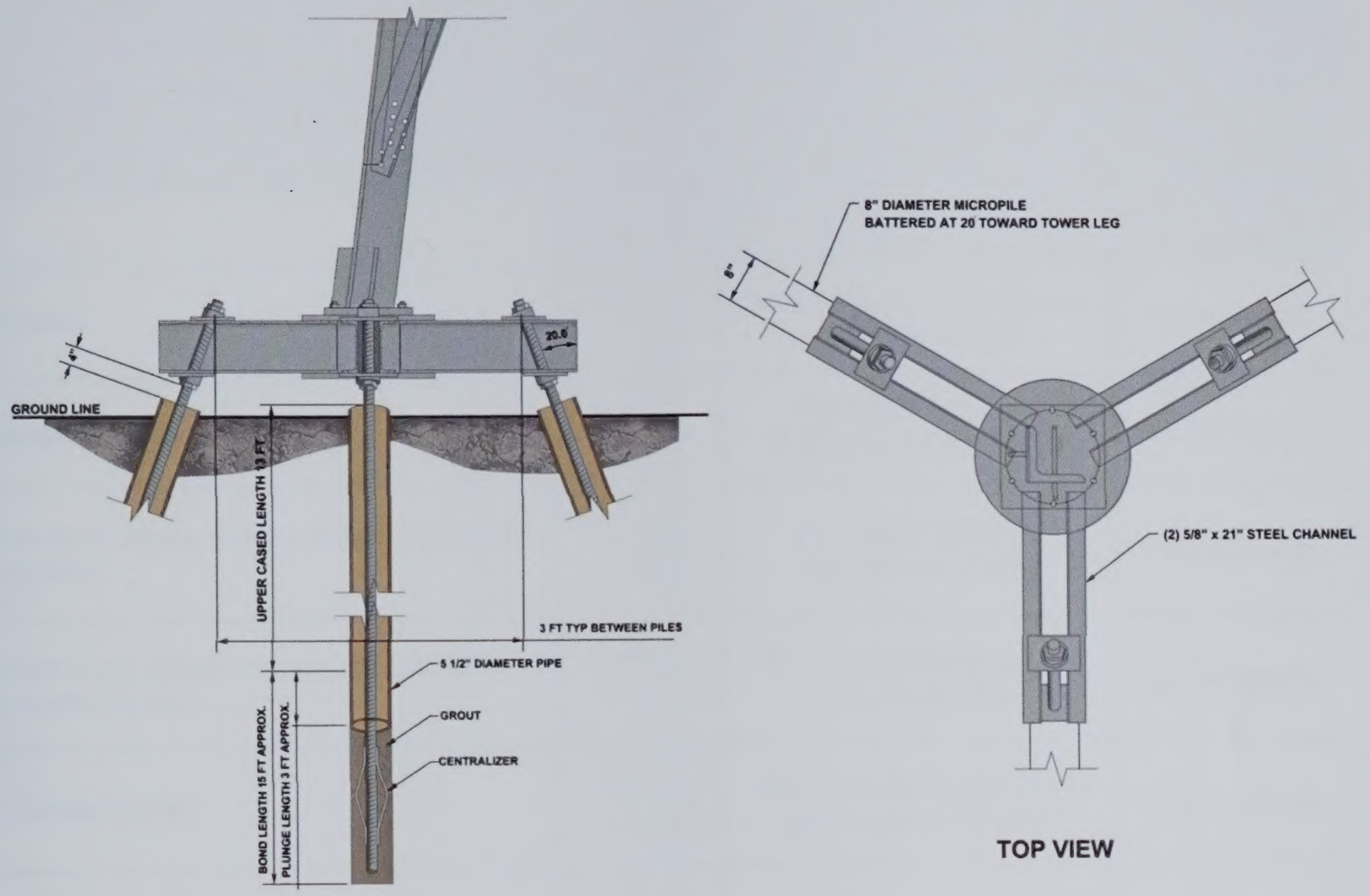
1.8 HELICOPTER MITIGATION

The following sites and ground disturbing construction activities would be required to construct the new transmission line within the identified helicopter construction areas: portable landing pads, helicopter fly yards/staging areas and associated temporary access roads, tower structure vegetation clearing, guard structures at major crossings, and access road pullouts. Refer to Table 5 for ground disturbance estimates for the Helicopter Mitigation.

The transmission line materials (tower steel, conductor reels, structure hardware, etc.) would be delivered by truck to the helicopter fly yards/staging areas. Vegetation clearing may be required at these sites to ensure safe working conditions. The fly yards/staging areas would serve as helicopter support yards for fueling and maintenance, as well as for the transport of materials and personnel. Towers may also be assembled in sections at these yards prior to delivery to the tower sites. Heavy lift helicopters would then fly the towers from the yards to the tower sites.

Portable landing pads would be located at each tower site. These pads would allow helicopters to load and unload personnel, tools, and equipment necessary for construction of foundations and assembly of tower structures. Helicopter-constructed towers that would not be in close proximity to existing access roads would utilize micropile foundations. For each tower leg, micropile foundations would use a group of three to eight 6- to 9-inch diameter casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth anywhere from one to eight feet below the ground surface, depending on the terrain. Figure 5 illustrates the plan view and sections of a micropile foundation.

FIGURE 5. MICROPILE FOUNDATION


4"
20.0°
GROUND LINE
UPPER CASED LENGTH 13 FT.
3 FT TYP BETWEEN PILES
5 1/2" DIAMETER PIPE
GROUT
CENTRALIZER
BOND LENGTH 15 FT APPROX.
PLUNGE LENGTH 3 FT APPROX.
8" DIAMETER MICROPILE
BATTERED AT 20 TOWARD TOWER LEG
8"
(2) 5/8" x 21" STEEL CHANNEL

LATTICE TOWER LEG SUPPORT

TOP VIEW

Conductor installation would proceed as for double-circuit tower installation. The equipment necessary for conductor installation would be large, heavy construction equipment that could only be brought in by truck. Some NFS roads could need maintenance or improvement to allow pulling and tensioning, but no new access or spur roads would be created for conductor installation on the helicopter-constructed towers.

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Table 5 Ground Disturbance Estimates for the Proposed 230 kV Double-Circuit Transmission Line

Disturbance Description	Double-Circuit Steel Lattice Towers with Helicopter Stringing of Conductors		Three-Circuit Tower Mitigation (Three-Circuit Steel Lattice Towers with Helicopter Stringing of Conductors)				Helicopter Mitigation (Steel Lattice Towers with Helicopter Installation of Towers and Conductors)	
			Three-Circuit		Temporary Transmission Line			
	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance
	Temporary Disturbance During Installation							
Tower installation	200 x 200 ft. (0.9 acre) per tower ±5 towers per mile[1]	4.6 acres per mile	200 x 200 ft. (0.9 acre) per tower ±7 towers per mile	6.4 acres per mile	50 X 100 ft. (0.1 acre) per tower ±8 towers per mile	0.9 acre per mile	100 x 100 ft. (0.2 acre) per tower ±5 towers per mile	1 acre per mile
Guard structures at major crossings	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acre per mile	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acre per mile	40 X 100 ft. (0.09 acres) One crossing every 5 miles	0.02 acre per mile	200 x 300 ft. (1.3 acres) One crossing every 5 miles	0.3 acre per mile
Helicopter fly yards / staging areas (includes fueling station at one of the sites)	200 x 200 ft(0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 ft (0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 ft (0.9 acre) One site every 5 miles	0.2 acre per mile	650 x 650 ft. (10 acres) One site every 5 miles	2 acres per mile
Landing area/Portable helicopter landing pads (includes vegetation clearing for site)	50 x 50 ft(0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft. (0.06 acre) per site Five sites per mile	0.3 acre per mile
Pulling and tensioning sites	200 x 500 ft (2.3 acres) per site One site every 2.5 miles[2]	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile
Sleeving and miscellaneous stringing operations	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	50 x 100 ft (0.1 acres) per site One site every 2.5 miles	0.05 acre per mile	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile
Total Average Temporary Disturbance[3]	**6.2 acres per mile**		**8 acres per mile**		**2.1 acres per mile**		**3.7 acres per mile**	
	Permanent Disturbance							
Tower sites, including vegetation clearance within a 10-foot radius around base of towers in accordance with state law	60 X 60 ft (0.08 acres) ±5 towers per mile	0.2 acre per mile	45 x 50 ft. (0.05 acre) ±7 towers per mile	0.14 acre per mile	N/A	N/A	60 x 60 ft. (0.08 acre) ±5 towers per mile	0.2 acre per mile
Total Average Permanent Disturbance[4]	**0.2 acre per mile**		**0.14 acre per mile**		**N/A**		**0.2 acre per mile**	

Information based on LADWP and POWER Engineers, Inc. estimates. Actual disturbance areas may be smaller based on final engineering design.

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[1] For slopes over 10% (ground disturbance categories 4-6), site dimensions would be 200 x 250 ft. (1.2 acres) and have an average disturbance of 5.8 acres per mile.

[2] For slopes over 10% (ground disturbance categories 4-6), sites would be every 2 miles and have an average disturbance of 1.2 acres per mile.

[3] Access and spur road disturbances included in Table 1.

[4] Ibid.

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1.9 OPERATION OF TRANSMISSION LINES

The nominal voltage for the BRRTP transmission line would be 230 kV AC. There may be minor variations of up to five percent above the nominal level depending upon load flow.

1.9.1 Permitted Uses

After the transmission line has been energized, land uses that are compatible with safety regulations (such as agriculture and grazing) would be permitted in and adjacent to the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses on public lands that comply with local regulations would be permitted adjacent to or within the ROW, with require approval from the appropriate agency. Permission to use the ROW on private lands would have to be obtained from the utility owning the transmission line.

1.9.2 Safety

Safety is a primary concern in the design of this 230 kV transmission line. The AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the switching station would be grounded. All fences, metal gates, pipelines, and other metal components that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside of the ROW may also occur.

1.10 MAINTENANCE OF TRANSMISSION LINES

The 230 kV transmission line would be inspected several times annually by both ground and air patrols. Maintenance would be performed as needed. When access is required for non-emergency maintenance and repairs, LADWP would adhere to the same precautions and procedures that were taken during the original construction.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged equipment or infrastructure. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance. Restoration procedures following completion of repair work would be those prescribed for project implementation construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Details would be provided in the COM Plan and POD prior to line construction.

1.10.1 Vegetation Management

Vegetation management along the transmission line ROW would be required by the North American Reliability Council (NERC). In compliance with the NERC's Standard FAC-003-l, LADWP would prepare a Vegetation Management Plan for the BRRTP. The Vegetation Management Plan would be included in the COM Plan to be completed prior to the issuance of a Notice to Proceed from the USFS and BLM. Vegetation management would consist of routine tree trimming to maintain the required minimum 10-foot clearance from conductors to vegetation (California Public Resources Code [PRC] 4293); clearance of flammable brush vegetation within a 10-foot radius around the base of transmission line towers in accordance with California PRC 4292; and clearance immediately adjacent to access roads to permit adequate access to the facilities.

1.10.2 Access Road Maintenance

Ongoing access road maintenance would be conducted in accordance with existing or new road authorizations issued to LADWP. Access road maintenance consists of those activities necessary to allow continued access to the ROW and/or each tower structure. These activities may include grading, and maintenance of drainage systems, bridges, culverts, fences, gates and signs. Motor graders, backhoes, dump trucks and pickups are used to maintain access roads.

1.11 DECOMMISSIONING OF TRANSMISSION LINES

At the end of the useful life of the proposed Project, if the facility were no longer required, or if extension of the authorizations were not granted by federal land agencies at the time they expired, the transmission line would be abandoned. Subsequently, conductors, insulators and hardware would be dismantled and removed from the ROW. Tower structures would be removed and foundations broken off below ground surface.

If the line and associated ROW are abandoned at some future date, the ROW would be available for the same uses that existed prior to construction of the Project. Following abandonment and removal of the transmission line from the ROW, any areas disturbed to dismantle the line would be restored and rehabilitated as near as possible to their original condition.

2.0 ADDITION OF NEW 230 KV CIRCUIT

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures (towers 1-1 through 12-1). This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (2,156 kcmil "Bluebird" ACSS/AW) as that proposed for the new 230 kV transmission line between Barren Ridge and Haskell Canyon Switching Stations.

The addition of a new circuit on existing towers would require many of the same activities of a new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). However, all work would be within existing ROW and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor. Specific towers requiring reinforcement would be determined following detailed design of the Project. Tower reinforcement would not alter the general design or the location of the structures. This process would generally include reinforced foundations or steel member replacements.

3.0 RECONDUCTORING

LADWP proposes the reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line with larger conductors between the Barren Ridge Switching Station and Rinaldi Substation (towers 176-1 through 251-1). The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor. The new conductor would have a larger diameter that allows for greater electrical capacity.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). Removal of the existing conductor would be used to string a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing 250-foot-wide ROW, with no additional ROW required. Some of the towers would need to be modified, replaced, and/or have foundations reinforced or replaced to carry the additional weight of the new heavier conductor.

4.0 NEW HASKELL CANYON SWITCHING STATION

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge-Haskell Canyon, existing Castaic-Northridge, Castaic-Sylmar, Castaic-Olive, and the proposed Castaic to Haskell Canyon).

The station would be approximately 500 feet by 600 feet to accommodate the necessary circuit positions, which are made up of equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide and would be enclosed by chain-link fencing with barbed-wire extension for security. Figure 6 illustrates the preliminary design layout for the station. Figure 7 illustrates the preliminary grading plan for the station.

Necessary pre-construction geotechnical investigation on-site would include six borings by a drill rig to investigate bedrock and soil stability and four cone penetration test locations after site grading to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. Construction would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut and fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. A 16-foot wide paved road and 100-foot by 100-foot gravel parking area would be required. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 120-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would be terminated into the switching station (i.e., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would need support and

require the installation of galvanized steel structures. An existing 115 kV transmission line may need to be relocated around the proposed station. High-voltage bus work consisting of aluminum jumpers and tubing would be installed within the station.

FIGURE 6. HASKELL CANYON SWITCHING STATION DESIGN LAYOUT

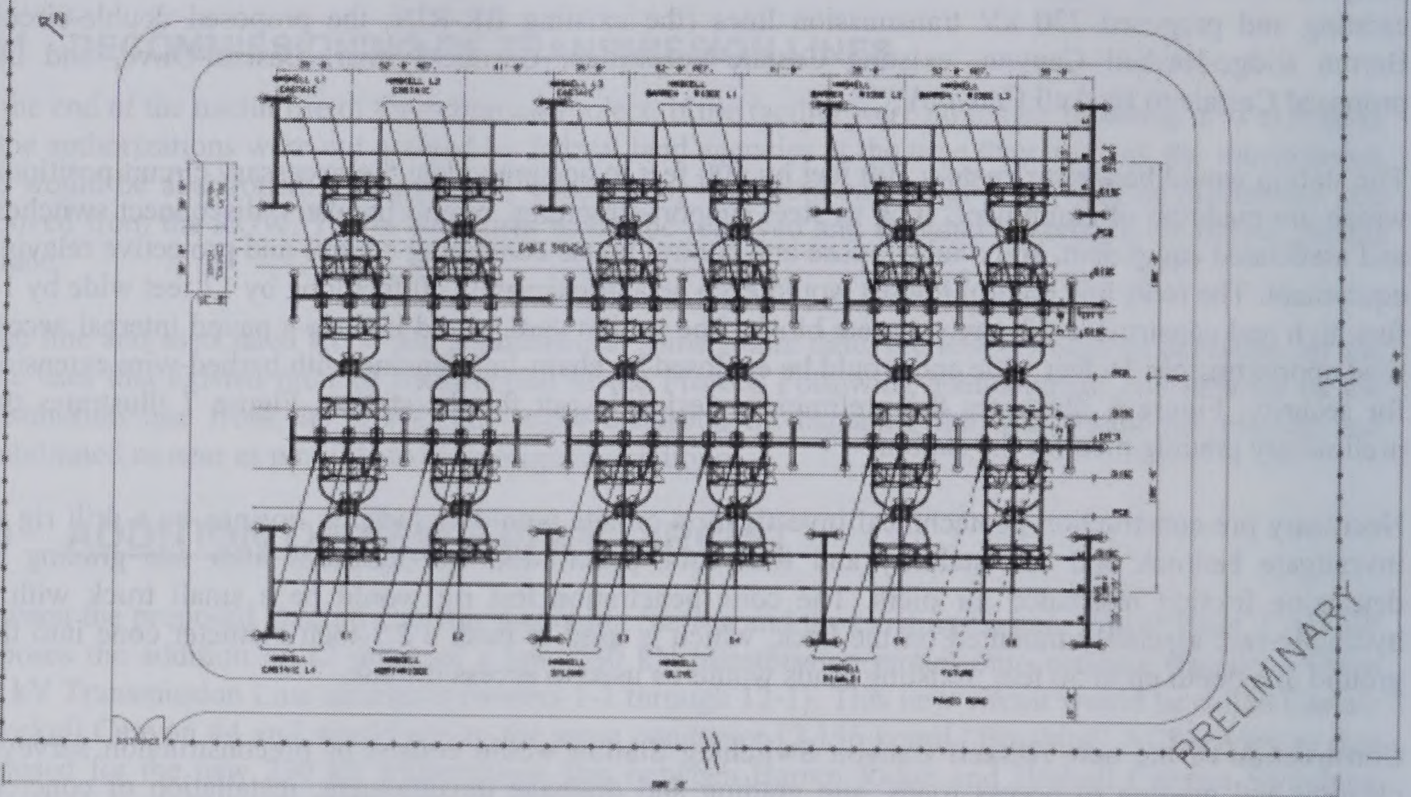
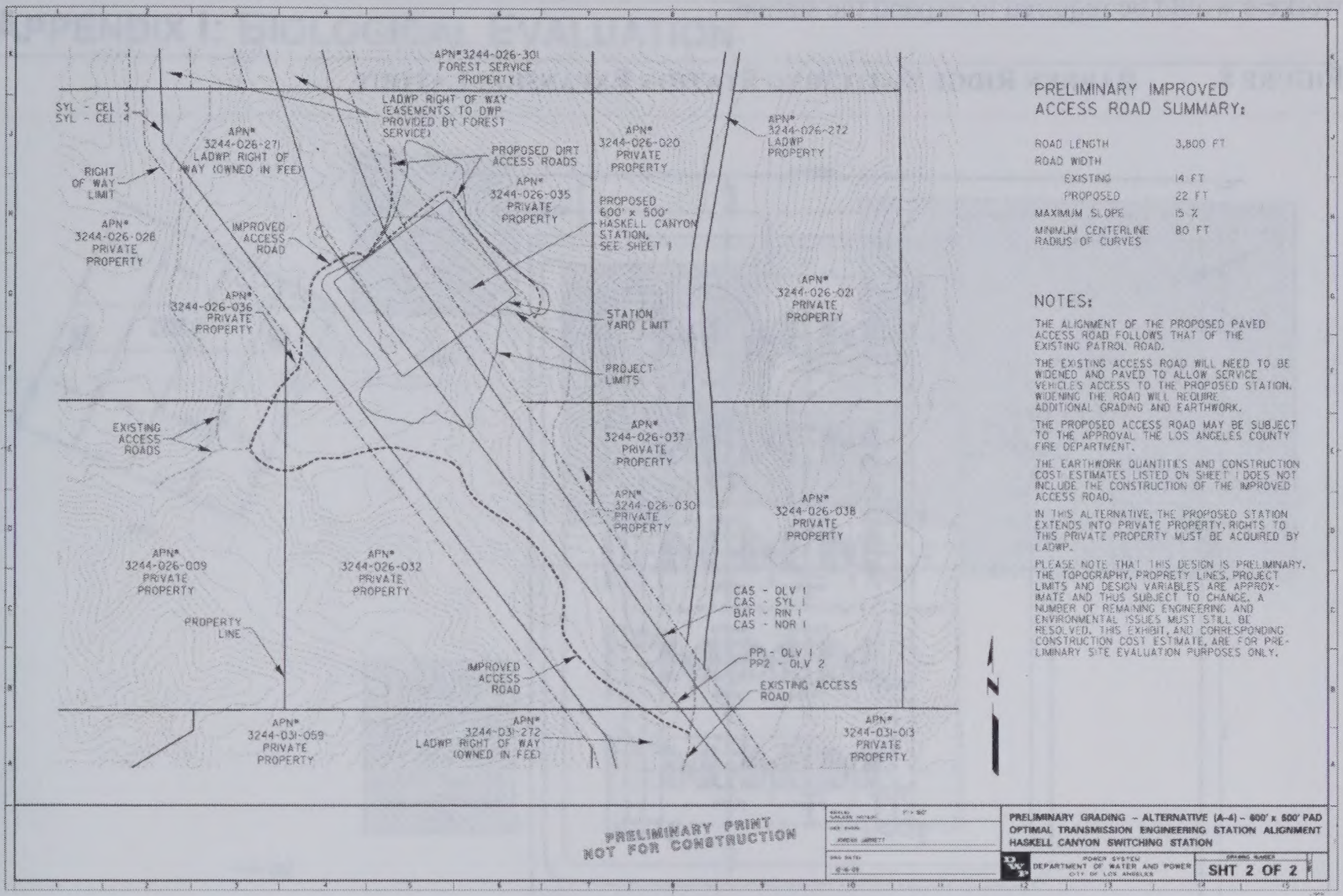

N
HASKELL L1 CASTAIC
HASKELL L2 CASTAIC
HASKELL L3 CASTAIC
HASKELL BARREN - RIDGE L1
HASKELL BARREN - RIDGE L2
HASKELL BARREN - RIDGE L3
HASKELL CASTAIC L4
HASKELL NORTHRIDGE
HASKELL SYLMAR
HASKELL OLIVE
HASKELL RINALDI
FUTURE
PAVED ROAD
PRELIMINARY

FIGURE 7. HASKELL CANYON GRADING PLAN


APN#3244-026-301 FOREST SERVICE PROPERTY
SYL - CEL 3
SYL - CEL 4
LADWP RIGHT OF WAY (EASEMENTS TO DWP PROVIDED BY FOREST SERVICE)
APN# 3244-026-271 LADWP RIGHT OF WAY (OWNED IN FEE)
PROPOSED DIRT ACCESS ROADS
APN# 3244-026-020 PRIVATE PROPERTY
APN# 3244-026-272 LADWP PROPERTY
RIGHT OF WAY LIMIT
APN# 3244-026-035 PRIVATE PROPERTY
APN# 3244-026-026 PRIVATE PROPERTY
IMPROVED ACCESS ROAD
PROPOSED 600' x 500' HASKELL CANYON STATION. SEE SHEET 1
APN# 3244-026-036 PRIVATE PROPERTY
STATION YARD LIMIT
APN# 3244-026-021 PRIVATE PROPERTY
PROJECT LIMITS
EXISTING ACCESS ROADS
APN# 3244-026-037 PRIVATE PROPERTY
APN# 3244-026-030 PRIVATE PROPERTY
APN# 3244-026-038 PRIVATE PROPERTY
APN# 3244-026-009 PRIVATE PROPERTY
APN# 3244-026-032 PRIVATE PROPERTY
CAS - OLV 1
CAS - SYL 1
BAR - RIN 1
CAS - NOR 1
PROPERTY LINE
PP1 - OLV 1
PP2 - OLV 2
IMPROVED ACCESS ROAD
EXISTING ACCESS ROAD
APN# 3244-031-059 PRIVATE PROPERTY
APN# 3244-031-272 LADWP RIGHT OF WAY (OWNED IN FEE)
APN# 3244-031-013 PRIVATE PROPERTY
N
PRELIMINARY PRINT NOT FOR CONSTRUCTION
SHT 2 OF 2

PRELIMINARY IMPROVED ACCESS ROAD SUMMARY:

ROAD LENGTH	3,800 FT
ROAD WIDTH	
EXISTING	14 FT
PROPOSED	22 FT
MAXIMUM SLOPE	15 %
MINIMUM CENTERLINE RADIUS OF CURVES	80 FT

NOTES:

THE ALIGNMENT OF THE PROPOSED PAVED ACCESS ROAD FOLLOWS THAT OF THE EXISTING PATROL ROAD.

THE EXISTING ACCESS ROAD WILL NEED TO BE WIDENED AND PAVED TO ALLOW SERVICE VEHICLES ACCESS TO THE PROPOSED STATION. WIDENING THE ROAD WILL REQUIRE ADDITIONAL GRADING AND EARTHWORK.

THE PROPOSED ACCESS ROAD MAY BE SUBJECT TO THE APPROVAL THE LOS ANGELES COUNTY FIRE DEPARTMENT.

THE EARTHWORK QUANTITIES AND CONSTRUCTION COST ESTIMATES LISTED ON SHEET 1 DOES NOT INCLUDE THE CONSTRUCTION OF THE IMPROVED ACCESS ROAD.

IN THIS ALTERNATIVE, THE PROPOSED STATION EXTENDS INTO PRIVATE PROPERTY, RIGHTS TO THIS PRIVATE PROPERTY MUST BE ACQUIRED BY LADWP.

PLEASE NOTE THAT THIS DESIGN IS PRELIMINARY. THE TOPOGRAPHY, PROPRETY LINES, PROJECT LIMITS AND DESIGN VARIABLES ARE APPROXIMATE AND THUS SUBJECT TO CHANGE. A NUMBER OF REMAINING ENGINEERING AND ENVIRONMENTAL ISSUES MUST STILL BE RESOLVED. THIS EXHIBIT, AND CORRESPONDING CONSTRUCTION COST ESTIMATE, ARE FOR PRELIMINARY SITE EVALUATION PURPOSES ONLY.

PRELIMINARY GRADING – ALTERNATIVE (A-4) – 600' x 500' PAD
OPTIMAL TRANSMISSION ENGINEERING STATION ALIGNMENT
HASKELL CANYON SWITCHING STATION

POWER SYSTEM
DEPARTMENT OF WATER AND POWER
CITY OF LOS ANGELES

5.0 EXPANSION OF BARREN RIDGE SWITCHING STATION

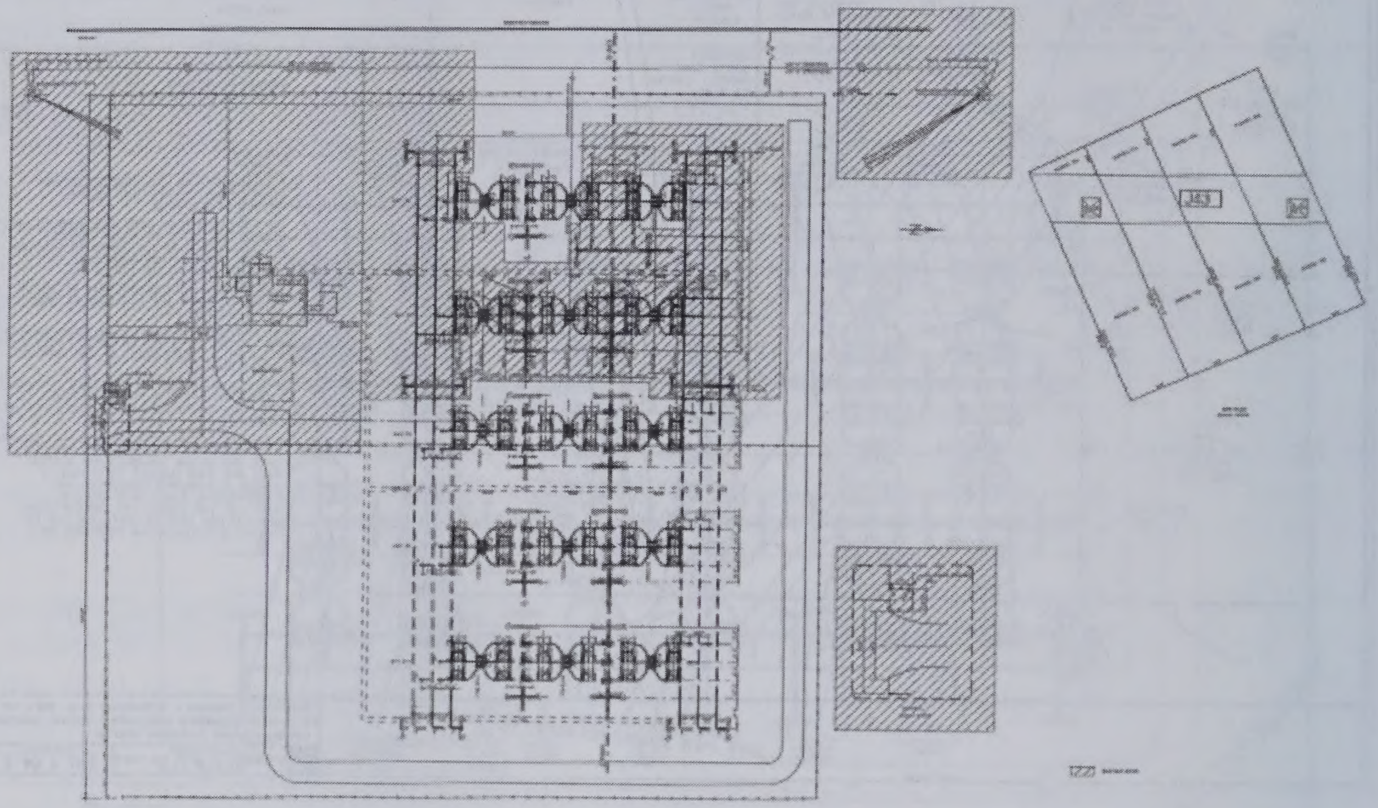
LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet by 500 feet, for a total station size of 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and drainage area. Figure 8 illustrates the preliminary design layout for the station.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station as described above. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Necessary pre-construction geotechnical on-site investigation would include two test pits excavated by a backhoe to investigate soil density and settlement, and four cone penetration test locations on-site to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

It is estimated that 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 90-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. An estimated 8 months with approximately 60 workers would be required to expand the station.

FIGURE 8. BARREN RIDGE SWITCHING STATION EXPANSION LAYOUT



APPENDIX I: BIOLOGICAL EVALUATION

June 2012

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER

Barren Ridge Renewable Transmission Project

Biological Evaluation

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116313
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POWER
ENGINEERS

Biological Evaluation
Barren Ridge Renewable Transmission Project

Angeles National Forest

June 2012

**REVIEWED AND
APPROVED BY:** ______________________ **DATE:** ____________________
**Nathan Sill
Wildlife Biologist, Angeles National Forest**

**REVIEWED AND
APPROVED BY:** ______________________ **DATE:** ____________________
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1.0 INTRODUCTION

The City of Los Angeles Department of Water and Power (LADWP) is proposing to construct the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access clean, renewable resources in the Tehachapi Mountains and Mojave Desert areas, and to improve reliability and upgrade transmission capacity. LADWP, the U.S. Department of Agriculture, Forest Service (Forest Service) and the U.S Department of the Interior, Bureau of Land Management (BLM) are preparing a joint Environmental Impact Statement (EIS) / Environmental Impact Report (EIR) for the proposed BRRTP. LADWP is the California Environmental Quality Act (CEQA) Lead Agency, while the Forest Service and BLM are the federal Co-Lead Agencies under the National Environmental Policy Act (NEPA).

The Forest Service prepares biological evaluations as part of the NEPA process to review programs and activities to determine their potential effect upon Sensitive species. Each Regional Forester maintains a list of Sensitive species for their respective region. This report is prepared for the Forest Service sensitive species listed by the Regional Forester, R5-USDA. The Forest Service Manual (FSM) (FSM 2670.32) requires the Forest Service to prepare a biological evaluation to determine effects and to avoid or minimize project effects upon the species.

The objective of this biological evaluation is to ensure Forest Service actions do not contribute to the loss of viability of any native or desired non-native plant or animal species or trends toward Federal listing of any species. Another objective is to provide a process and standard by which to ensure that Sensitive species receive full consideration in the decision-making process. This biological evaluation includes identification of Sensitive species, description of habitat, analysis of effects, determination of effects, cumulative effects, and mitigation (FSM 2672.42).

Tables 5 and 6 identify all Forest Service sensitive species on the Angeles National Forest (ANF) and those species identified for detailed analysis in this document. All species were considered for analysis; however, only those species with suitable habitat in the Project area or species known to be present or likely to be present in the Project area were analyzed in detail in this analysis. Species without suitable habitat potentially affected by the Project, or species considered absent from the Project area, were dismissed from detailed analysis. For federally listed threatened, endangered, proposed, candidate and critical habitat evaluation, refer to the Biological Assessment prepared for the U.S. Fish and Wildlife Service (USFWS) (USFS/BLM/LADWP 2011a).

1.1 CURRENT FOREST SERVICE MANAGEMENT DIRECTION

Management direction for threatened, endangered, protected and sensitive species (TEPS) on the Forest comes from the Angeles National Forest Land Management Plan (LMP) adopted by the Record of Decision signed on September 20, 2005 (USFS 2005). Strategic Goals, Program Strategies and Tactics, Standards, and Appendices A-J of the LMP provide guidance on management of wildlife and botany resources.

Specific direction related to protection of TEPS species comes from Standards 11-44 (Record of Decision [ROD] Part 3, pages 6-10). Appendix B (Record of Determination) includes a summary of species guidance recommendations. These species guidance documents include information to assist in the development of project-specific design criteria (summarized from Land Management Plan, Appendix H).

Direction for management of wildlife and botany resources are included in Forest Service Manual 2670

1.1.1 National Forest Management Act (NFMA) for all Species:

The National Forest Management Act (NFMA) of 1976 states that "fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area." For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to ensure its continued existence is well-distributed in the planning area. In order to ensure that viable populations will be maintained, habitat must be provided to support at least a minimum number of reproductive individuals and that habitat must be well-distributed so that those individuals can interact with others in the planning area (36 CFR 219.19).

The regulations also mandate that "all management prescriptions shall provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan" (36 CFR 219.27(a)(6)).

Diversity states in part: "Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species" (36 CFR 219.27(g)).

1.1.2 Land Management Plan Standards

The following standards are taken from Part 3 of the LMP and are applicable to impacts to plants and wildlife as described below for the BRRTP (USFS 2005a, Part 3, pages 3 – 13).

- **S4:** Design fuelbreaks in forests to be open; averaging no more than 40 percent crown closure along the center corridor with an understory of grasses, forbs, and small shrubs. Thinning of forests should favor retention of large-diameter trees. Crown closure and understory vegetation increase gradually, moving from the inside toward the outside of the shaded fuelbreak.
- **S5:** Treat all freshly cut live or recently dead conifer stumps with a registered fungicide to prevent the establishment of annosus root disease.
- **S6:** Seed to be used on National Forest System lands will be certified to be free of noxious weeds. Where available, only locally collected native seed will be used, or seeds will be used from species that are noninvasive and nonpersistent. When available, wattles, mulch and livestock feed to be used on National Forest System lands will be certified to be free of noxious weeds.
- **S7:** There are extensive areas within and adjacent to the national forests of southern California meeting the definition of Wildland/Urban Interface (WUI) as described in the Healthy Forests Restoration Act of 2003. WUI (as defined by the Act) is a variable width up to 1.5 miles from communities at risk or as defined in individual community fire protection plans. This forest plan further identifies a direct protection buffer (WUI Defense Zone) and an indirect protection buffer (WUI Threat Zone) that fall within the broader definition WUI. A WUI Defense Zone is the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. The WUI Threat Zone is an additional strip of vegetation modified to reduce flame heights and radiant heat. The Threat Zone generally extends approximately 1.25 miles out from the Defense Zone boundary. Yet, actual extents of Threat Zones are based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, and natural barriers to fire and community protection plans, and therefore could extend well beyond the 1.25 mile. The two zones together are designed to make most structures more defendable.
- **S8:** Community protection needs within the WUI Defense Zone take precedence over the requirements of other forest plan direction, including other standards identified in Part 3 of the forest plan. If expansion beyond the 300-foot minimum width of the defense zone is needed due to site-specific conditions, projects will be designed to mitigate effects to other resources to the extent possible.
- **S11:** When occupied or suitable habitat for a threatened, endangered, proposed, candidate or sensitive (TEPCS) species is present on an ongoing or proposed project site, consider species guidance documents (see [LMP Part 3] Appendix H [pages 71 – 75]) to develop project-specific

or activity-specific design criteria. This guidance is intended to provide a range of possible conservation measures that may be selectively applied during site-specific planning to avoid, minimize or mitigate negative long-term effects on threatened, endangered, proposed, candidate or sensitive species and habitat. Involve appropriate resource specialists in the identification of relevant design criteria. Include review of species guidance documents in fire suppression or other emergency actions when and to the extent practicable.

- **S12:** When implementing new projects in areas that provide for threatened, endangered, proposed, and candidate species, use design criteria and conservation practices (see Appendix H) so that discretionary uses and facilities promote the conservation and recovery of these species and their habitats. Accept short-term impacts where long-term effects would provide a net benefit for the species and its habitat where needed to achieve multiple-use objectives.
- **S13:** Manage Critical Biological land use zones so that activities and discretionary uses are either neutral or beneficial for the species and habitats for which the area was established. Accept short-term adverse impacts to threatened, endangered, and proposed species if such impacts will be compensated by the accrual of long-term benefits to habitat for threatened, endangered, and candidate species.
- **S15:** Within riparian conservation areas retain snags and downed logs unless they are identified as a threat to life, property, or sustainability of the riparian conservation area.
- **S17:** In areas outside of Wildland/Urban Interface Defense Zones and fuelbreaks, retain soft snags and acorn storage trees unless they are a safety hazard, fire threat, or impediment operability.
- **S18:** Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.
- **S19:** Protect all spotted owl territories identified in the Statewide California Department of Fish and Game database (numbered owl sites) and new sites that meet the state criteria by maintaining or enhancing habitat conditions over the long-term to the greatest extent practicable while protecting life and property. Use management guidelines in the species conservation strategy (or subsequent species guidance document; see [LMP Part 3] Appendix H [pages 71 – 75]) to further evaluate protection needs for projects, uses and activities.
- **S20**: Maintain a limited operating period (LOP) prohibiting activities within approximately .25 miles of a California spotted owl nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15), unless surveys confirm that the owls are not nesting. Follow the USDA Forest Service (1993, 1994 or subsequent) protocol to determine whether owls are nesting. The LOP does not apply to existing road and trail use and maintenance, use of existing developed recreation sites, or existing special-uses, such as recreation residence tracts. When evaluating the need to implement a limited operating period, site- and project-specific factors need to be considered (use species management strategy or subsequent guidance; see [LMP Part 3] Appendix H [pages 71 – 75]).
- **S21:** California spotted owl habitat that is lost to development for a compelling reason should be mitigated up to a two-to-one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special-use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.
- **S22:** Except where it may adversely affect threatened and endangered species, linear structures such as fences, major highways, utility corridors, bridge upgrades or replacements, and canals will be designed and built to allow for fish and wildlife movement.
- **S24:** Mitigate impacts of on-going uses and management activities on threatened, endangered, proposed, and candidate species.

- **S25:** Conduct road and trail maintenance activities during the season of year that would have the least impact on threatened, endangered, and proposed wildlife species in occupied habitats, except as provided by site-specific consultation.
- **S27:** Use seasonal closures as specified by site-specific analysis to protect occupied bald eagle wintering, breeding, or nesting habitat.
- **S28:** Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites and within 0.5 miles of active roosts. Refer to California condor species account (or subsequent species guidance document; see Appendix H) for additional guidance.
- **S31:** Design new facilities or expansion of existing facilities to direct public use away from occupied habitat for threatened, endangered, proposed and candidate species.
- **S32:** When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist.
- **S33:** Manage Special Interest Areas so that activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established. Accept short-term adverse impacts to these resource values if such impacts will be compensated by the accrual of long-term benefit.
- **S37:** Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles. Mitigate impacts where such use does occur.
- **S42:** Include provisions for raptor safety when issuing permits for new power lines and communication sites (see guidelines in Appendix G). Also implement these guidelines for existing permits within one year in identified high-use flyways of the California condor, and within five years in other high-use raptor flyways. Coordinate with California Department of Fish and Game, U.S. Fish & Wildlife Service, and power agencies to identify the high-use flyways.
- **S47:** When designing new projects in riparian areas, apply the Five-Step Project Screening Process for Riparian Conservation Areas as described in Appendix E - Five-Step Project Screening Process for Riparian Conservation Areas.
- **S49:** Require fish passage instream flows associated with dams and impoundments where fish passage will enhance or restore native or selected nonnative fish distribution and not cause adverse effects to other native species.

1.1.3 Bald and Golden Eagle Protection Act (1940)

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668c, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: “disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior’’ (72 FR 31132; 50 CFR 22.3).

1.1.4 California Spotted Owl Conservation Strategy

A conservation strategy for the California spotted owl on the four Southern California national forests was completed in 2004. In accordance with the strategy, the following list of conservation practices should be considered for the California spotted owl:

- Maintain or enhance habitat conditions in all territories. All spotted owl territories identified in the statewide Fish and Game database (numbered owl sites) and new sites that meet the State criteria (see below) should be protected from habitat degradation and loss to the greatest extent practicable while protecting life and property.

- In areas without good surveys, all suitable habitat of moderate habitat value and above… should be protected from degradation or loss. In areas that have been surveyed thoroughly (e.g., San Bernardino Mountains) the national forests can protect known territories. In areas that have not been thoroughly surveyed, such as more remote portions of the Los Padres National Forest, suitable habitat should be protected even if occupancy has not been documented. In the absence of good data, all suitable habitat is considered occupied and important. Inventories should be conducted before implementing any management action that will alter habitat structure.
- Delineate and focus protection on spotted owl management areas of up to 600 acres, each comprised of a Home Range Core (HRC) containing a Protected Activity Center (PAC) and Nest Stand.
- Create a map and database of all PACs and HRCs on each Southern California National Forest.
- Update the maps and databases regularly as presence/absence surveys are conducted, projects are implemented, and/or stand conditions change.
- Where nest locations or activity centers have not yet been identified, conduct surveys in suitable habitat and map PACs and HRCs as soon as possible.
- Maintain a limited operating period (LOP) prohibiting activities within approximately ¼ mile of the nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15) unless surveys confirm that California spotted owls are not nesting. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of the project or activities suggests that either existing or proposed activities are likely to result in nest disturbance. When evaluating the need to implement a limited operating period, the following site- and project-specific factors need to be considered:
    - Proximity of activity (Does the activity occur within 0.25 mile of known or suspected activity center).
    - Duration of the activity (How long will the activity occur).
    - Timing of the activity (When in the year does the activity occur? What time of day [daytime versus nighttime] does the activity occur?)
    - Type of activity (Does the activity result in human intrusion or produce loud noises which may influence the behavior of the owl?)
    - Intensity of the activity (Does the activity result in noise levels which exceed ambient levels of the area?)
    - Status of the owl (Is the site occupied by a nesting pair? Pair? Single? Did the owls attempt to nest but failed?
    - Physiographic feature (Given the location of Alternative 2 and owl activity center, does the landscape [e.g., ridges] and vegetation provide screens or barriers to disturbance likely to result from the activity?)
- Prohibit type conversion of suitable or potentially suitable (i.e., successional stands) owl habitat. This does not apply to fuel breaks or WUI Defense Zones needed to protect human life and property.
- Loss of owl habitat to development should be mitigated up to a three to one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.
- Make every effort possible to keep the Southern California spotted owl population intact by maintaining the amount and spatial connectivity of suitable habitat. Avoid creating additional barriers to dispersal.
- Acquire habitat where possible. Priority should be on areas with potential for commercial or residential development that contain PACs and HRCs.

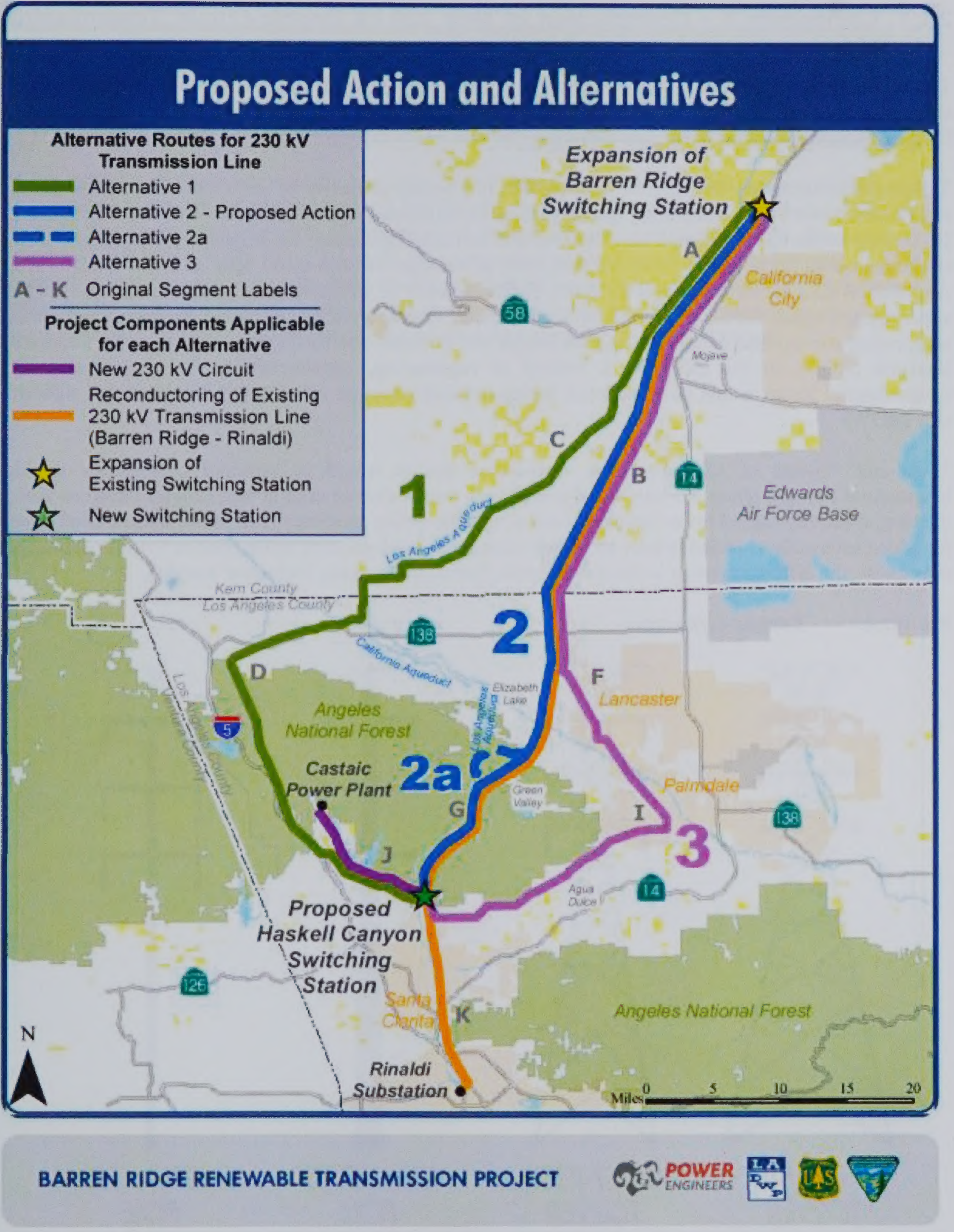
- Planned new activities or uses that have potential to adversely affect owls or suitable owl habitat will be surveyed to protocol prior to conducting the activity or authorizing the use. Suitable habitat will be identified and activity centers or nests will be identified if occupied. Potentially impacted territories should be monitored for 2 years following the activity or use. Utilize the [Forest Service] 1993 survey protocol for the spotted owl in California as modified by the Spotted Owl Biologist Team:
- Within ¼ mile of activity centers, clean up trash daily at recreation sites when dumpsters reach overflow conditions (concern is the attraction of crows and ravens, which could prey on spotted owl young).
- Locate new developed recreation sites, roads, OHV trails, and other facilities or improvements outside of PACs.
- Apply Limited Operating Period guidelines to special use permits. Do not issue permits for special uses or events within ¼ mile of a nest site or activity center that would cause disturbance during nesting season, including organized motor vehicle events on Forest System roads/trails or helicopter use for movies.

2.0 PROPOSED ACTION

The Project is located in Kern and Los Angeles counties. As proposed by LADWP, it would be 76 miles in length, extending from the Barren Ridge Switching Station to Rinaldi Substation, and extending approximately 12 miles from the Castaic Power Plant to the proposed Haskell Canyon Switching Station. As shown in Figure 1, the proposed BRRTP would include the following:

1) Construction of approximately 61 miles of a new 230 kilovolt (kV) double-circuit transmission line from the LADWP Barren Ridge Switching Station to Haskell Canyon;
2) Addition of approximately 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant;
3) Reconductoring of approximately 76 miles of the existing Barren Ridge-Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and the Rinaldi Substation;
4) Construction of a new switching station in Haskell Canyon;
5) Expansion of the existing Barren Ridge Switching Station.

FIGURE 1. PROPOSED ACTION AND ALTERNATIVES


Proposed Action and Alternatives
Alternative Routes for 230 kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
A - K Original Segment Labels
Project Components Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
A
B
C
D
F
G
I
J
K
1
2
2a
3
California City
Mojave
58
14
138
126
5
Edwards Air Force Base
Los Angeles Aqueduct
Kern County
Los Angeles County
California Aqueduct
Elizabeth Lake
Lancaster
Palmdale
Angeles National Forest
Castaic Power Plant
Green Valley
Agua Dulce
Proposed Haskell Canyon Switching Station
Santa Clarita
Rinaldi Substation
Los Angeles County
Ventura County
N
Miles 0 5 10 15 20
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS

2.1 PROJECT COMPONENTS COMMON TO ALL ALTERNATIVES

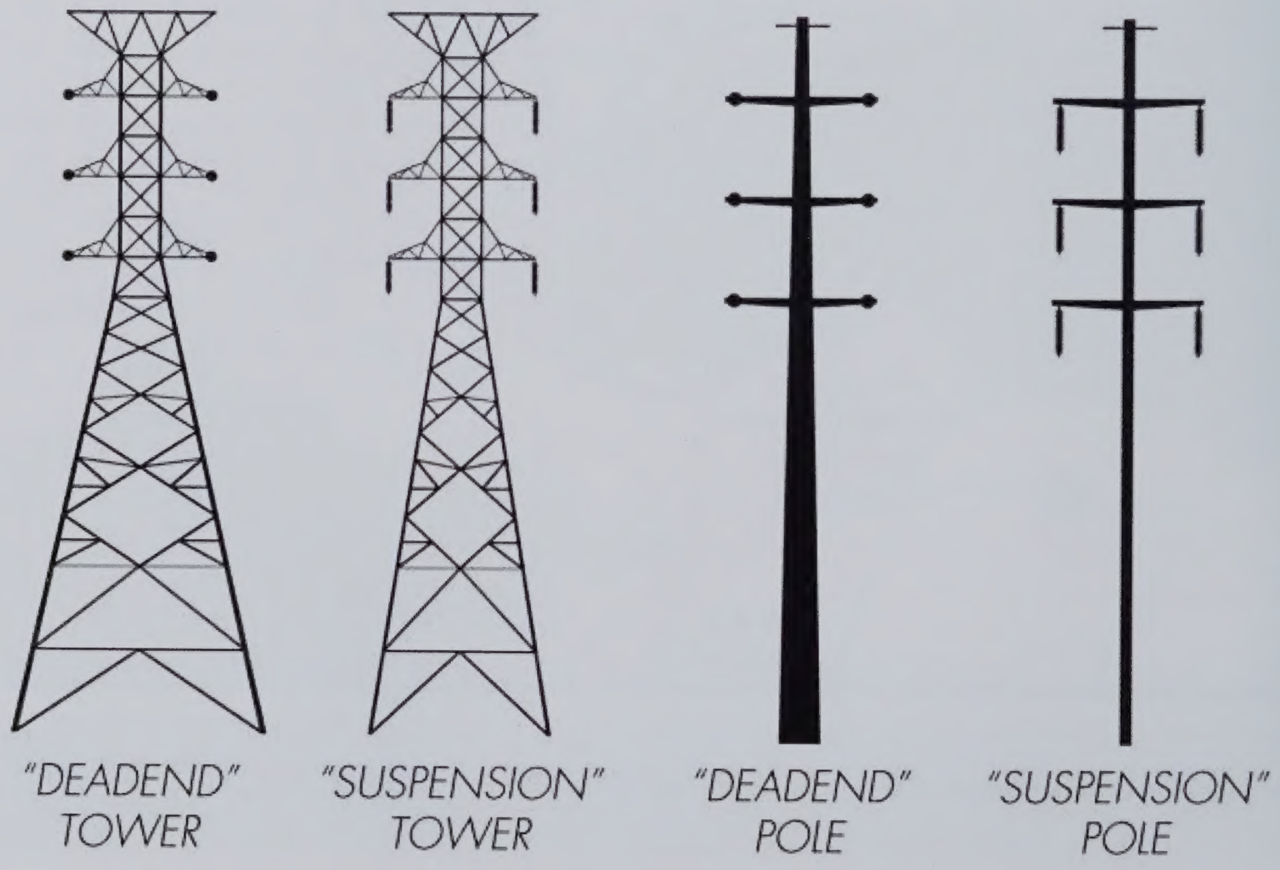
2.1.1 Component 1 - Construction of New 230 kV Double-Circuit Transmission Line

The proposed double-circuit 230 kV transmission line component of the BRRTP would consist of two alternating current (AC) circuits from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station in Haskell Canyon.

The proposed structures for the new transmission line would primarily be self-supporting double-circuit steel lattice towers fabricated from galvanized steel members, as shown on the left side of Figure 2. Depending on the environmental conditions of the surrounding terrain, the height of the proposed lattice structures would range from 110 to 195 feet, with an average tower-to-tower span of 1,000 to 1,100 feet. Appendix B lists the structure specifications for the number of structures per mile, average span length, and average heights for towers and components. Exact structure placement would be determined during engineering surveys and detailed design studies for the selected Alternative route following the Record of Decision (ROD) on the EIS/EIR. A variety of engineering, constructability, existing access, and environmental issues would be considered during detailed structure siting within the permitted right-of-way (ROW).

"Dead-end" towers of self-supporting, steel-lattice design would be required periodically to add longitudinal strength along the line. Dead-end towers would also be used at turn (angle) locations along the line, at heavily loaded tower locations, and at specific utility crossings (e.g., other transmission lines) for added safety. Dead-ended towers are of the same basic configuration as suspension towers (non-angle structures), the difference being in the tower "arms," insulator systems, and tower weights.

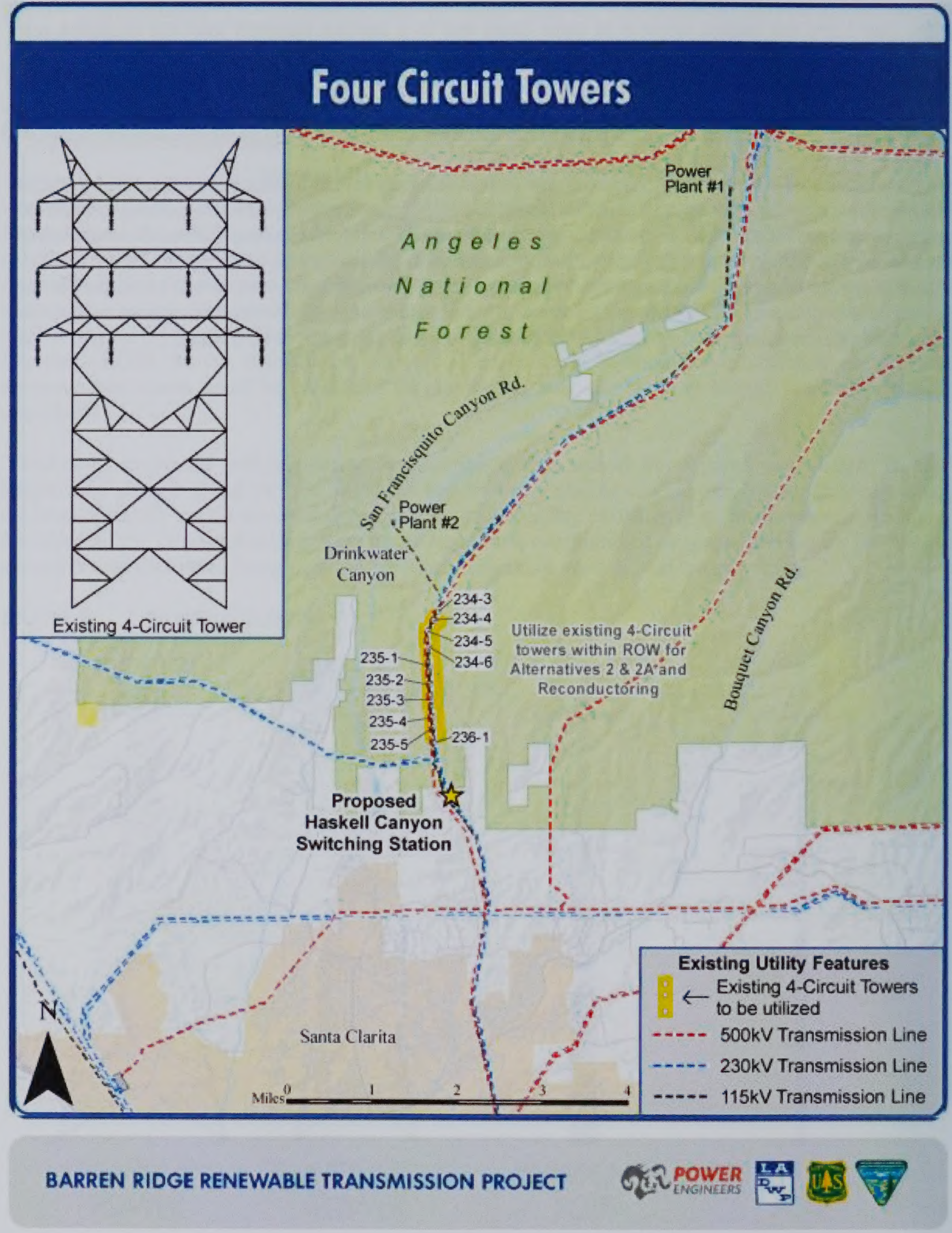
FIGURE 2. TYPES OF TOWERS



Self-supporting, tubular steel poles (TSP) have been proposed by LADWP as an available mitigation structure where appropriate to reduce potential impacts, such as conflicts with cultivation on agricultural lands. The TSPs can reduce impacts in some cases due to a smaller footprint than the proposed self-supporting steel lattice structures; however, more TSPs per mile are necessary due to a shorter average span between structures. The TSPs would have an average height range between 95 and 180 feet, depending on the conditions of the surrounding terrain, with an average tower-to-tower span of 700 to 800 feet. Refer to Figure 2 for an illustration of the double-circuit poles.

For the majority of the alignment, the two new 230 kV circuits would be placed on new double-circuit transmission towers, but for approximately 1.5 miles, the circuits would be placed on existing four-circuit structures that are located just north of the proposed Haskell Canyon Switching Station. Between where the existing BR-RIN crosses Dry Canyon to the intersection of the Castaic transmission lines, LADWP has existing four-circuit towers with three vacant positions. The existing towers would be utilized in this section for the proposed 230 kV double circuit transmission line instead of constructing new towers. See Figure 3 for the location and illustration of the existing four-circuit towers to be utilized.

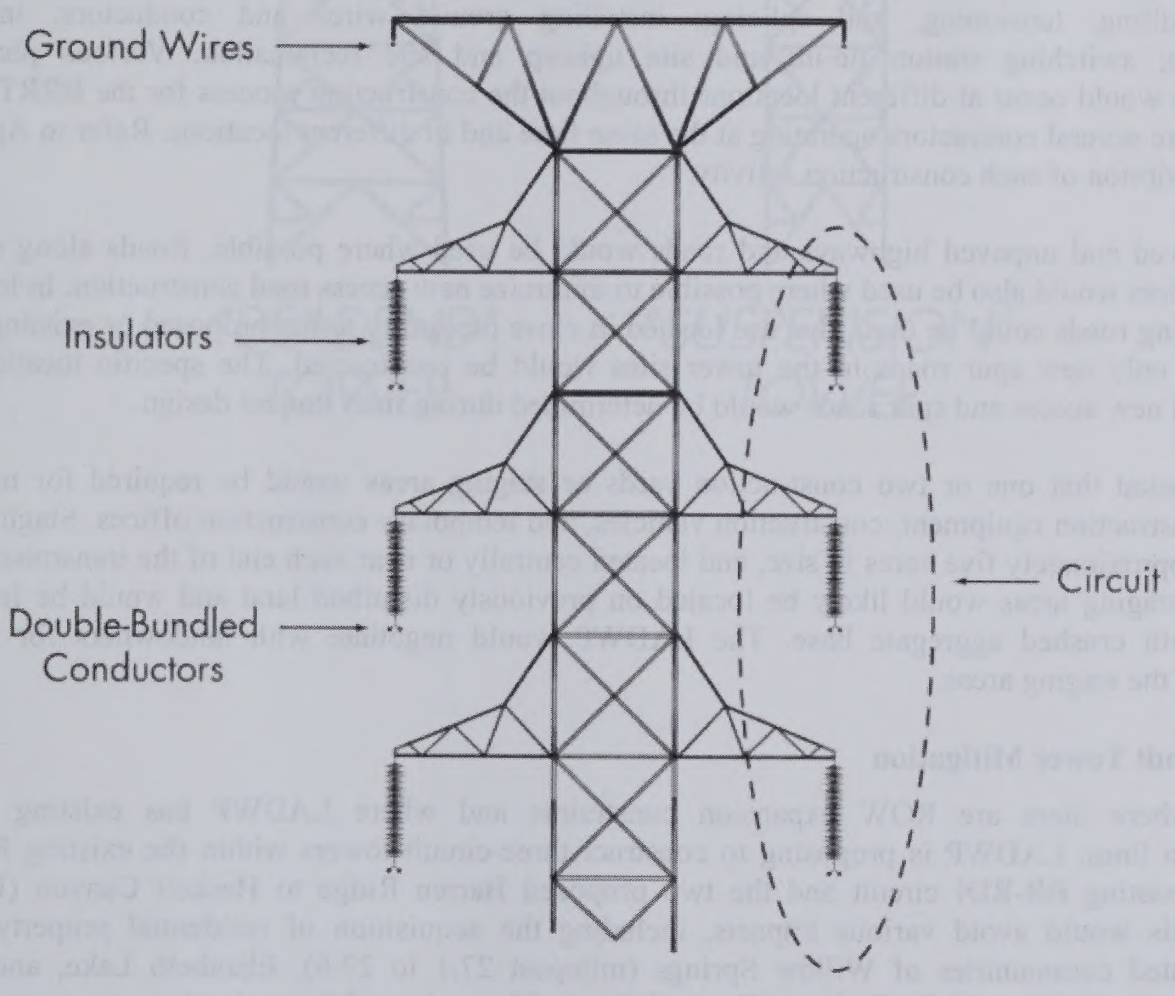
FIGURE 3. FOUR-CIRCUIT TOWERS TO BE UTILIZED


Four Circuit Towers
Existing 4-Circuit Tower
Power Plant #1
Angeles National Forest
San Francisquito Canyon Rd.
Power Plant #2
Drinkwater Canyon
234-3
234-4
234-5
234-6
235-1
235-2
235-3
235-4
235-5
236-1
Utilize existing 4-Circuit towers within ROW for Alternatives 2 & 2A and Reconductoring
Bouquet Canyon Rd.
Proposed Haskell Canyon Switching Station
Santa Clarita
N
Miles 0 1 2 3 4
Existing Utility Features
Existing 4-Circuit Towers to be utilized
500kV Transmission Line
230kV Transmission Line
115kV Transmission Line
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
L.A. DWP

The self-supporting steel lattice structures and TSPs would utilize concrete foundations. Steel lattice structures would require four footings (one for each leg); TSPs would require single footings. Footings would be steel-reinforced concrete pier type and be cast in place. The typical design for the concrete footings for lattice structures would be between 2.5 and 5.0 feet in diameter, with an average depth of 20 feet depending on soil conditions. Typical design for single foundations for TSPs would include augured holes approximately five to seven feet in diameter and 15 to 30 feet deep, depending on conditions. Formwork steel reinforcing would be assembled in the hole prior to casting concrete in place. Reinforcing steel would become integral to the lower leg of the steel lattice structure during assembly. An above-ground concrete form placed over each hole would result in a final concrete foundation height of 0.5 to 2.0 feet above ground level.

As illustrated in Figure 4, Typical Tower Components, each tower carries conductors ("wires"), insulators, and ground wires. The conductor being considered for the new double-circuit 230 kV transmission line and installation of the Castaic – Haskell Canyon #4 circuit on existing structures is a bundled 715.5 kcmil "Starling" ACSS/AW. The reconductoring of the BR-RIN transmission line between Barren Ridge Switching Station and Rinaldi Substation would require a bundled 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor.

FIGURE 4. TYPICAL TOWER COMPONENTS



Each circuit would consist of three phases ("wires") as illustrated in Figure 4. To increase the current-carrying capability of the transmission lines and reduce power loss, the Proposed Action (Alternative 2) would utilize bundled conductors installed for each phase. The bundled conductors would consist of two conductor cables connected by a spacer. The new 230 kV double-circuit transmission line would consist of a total of six double-bundled (12 individual) wires.

Minimum conductor height above the ground, under normal operation of the line, is 30 feet. Greater clearances may be required in certain areas to allow for clearances over trees or other vegetation that could pose a risk to the operation of the transmission line. Minimum conductor clearance would dictate the exact height of each tower based on topography and safety clearance requirements.

Insulators are used to provide the physical connection of conductors to structures. These system components are made of very low conducting materials (polymer insulators) that inhibit the flow of electric current from energized conductors to ground or to other energized system elements. Insulators and their associated hardware are to be configured in an "I" assembly to support conductors while maintaining required distances between phases and grounded structures. Each "I" string would consist of six-inch diameter insulators between six and eight feet long.

To shield conductors from hazard of direct lightning strikes by transferring lightning currents into the ground, overhead ground wires (shield wires) or fiber optic ground wire would be installed on top of new structures.

Construction of a transmission line involves the following general sequence of events: surveying activities; identifying and constructing access roads; clearing ROW and tower sites (including construction yards and batch plants); installing foundations; assembling and installing the towers; clearing, pulling, tensioning, and splicing; installing ground wires and conductors; installing counterpoise; switching station tie-in; and site upkeep and site reclamation. Various phases of construction would occur at different locations throughout the construction process for the BRRTP. This would require several contractors operating at the same time and in different locations. Refer to Appendix B for a description of each construction activity.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads could be used, that are located in close proximity to the proposed or existing ROW centerlines, only new spur roads to the tower sites would be constructed. The specific locations and design of all new access and spur roads would be determined during final Project design.

It is anticipated that one or two construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located centrally or near each end of the transmission line route. The staging areas would likely be located on previously disturbed land and would be level and surfaced with crushed aggregate base. The LADWP would negotiate with landowners for specific locations of the staging areas.

Three-Circuit Tower Mitigation

In areas where there are ROW expansion constraints and where LADWP has existing 230 kV transmission lines, LADWP is proposing to construct three-circuit towers within the existing ROW to carry the existing BR-RIN circuit and the two proposed Barren Ridge to Haskell Canyon (BR-HC) circuits. This would avoid various impacts, including the acquisition of residential property in the unincorporated communities of Willow Springs (milepost 27.1 to 27.6), Elizabeth Lake, and Green Valley (milepost 44.6 to 51.7). Refer to Figure 5 for an illustration of three-circuit tower types, and to Figure 6, the Three-Circuit Tower Mitigation Map, for proposed locations.

FIGURE 5. THREE-CIRCUIT TOWER TYPES

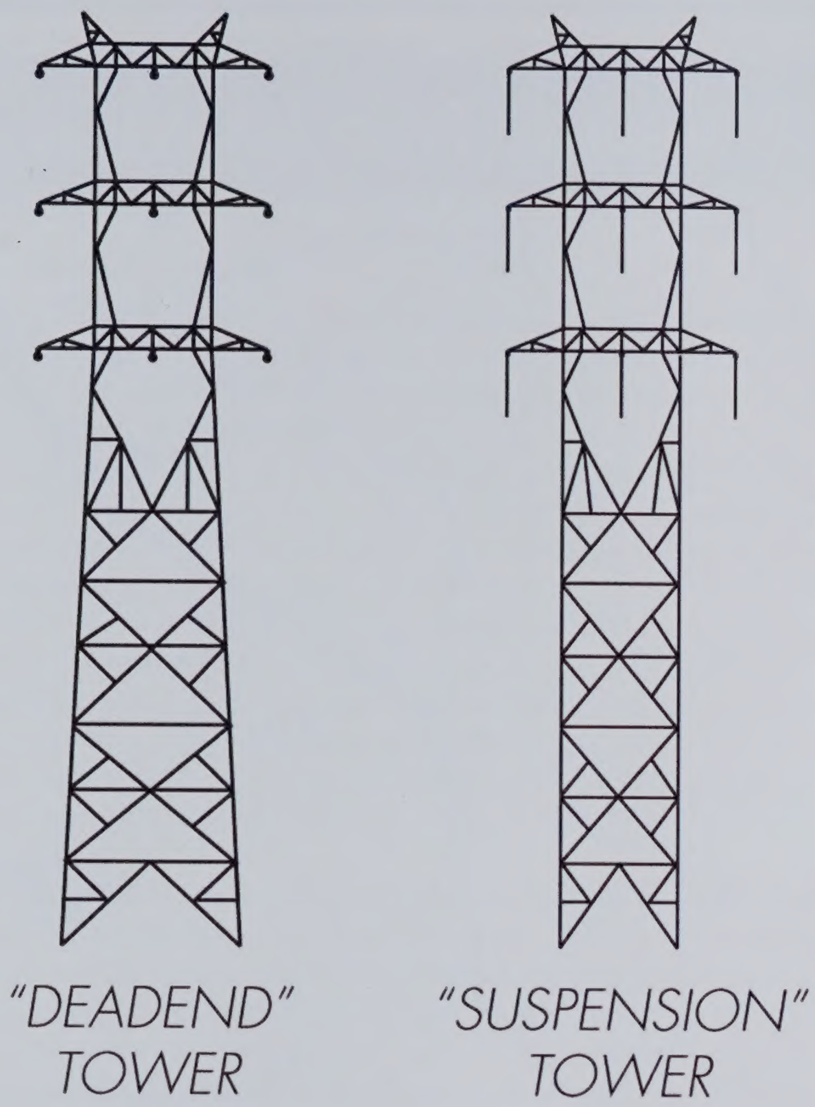
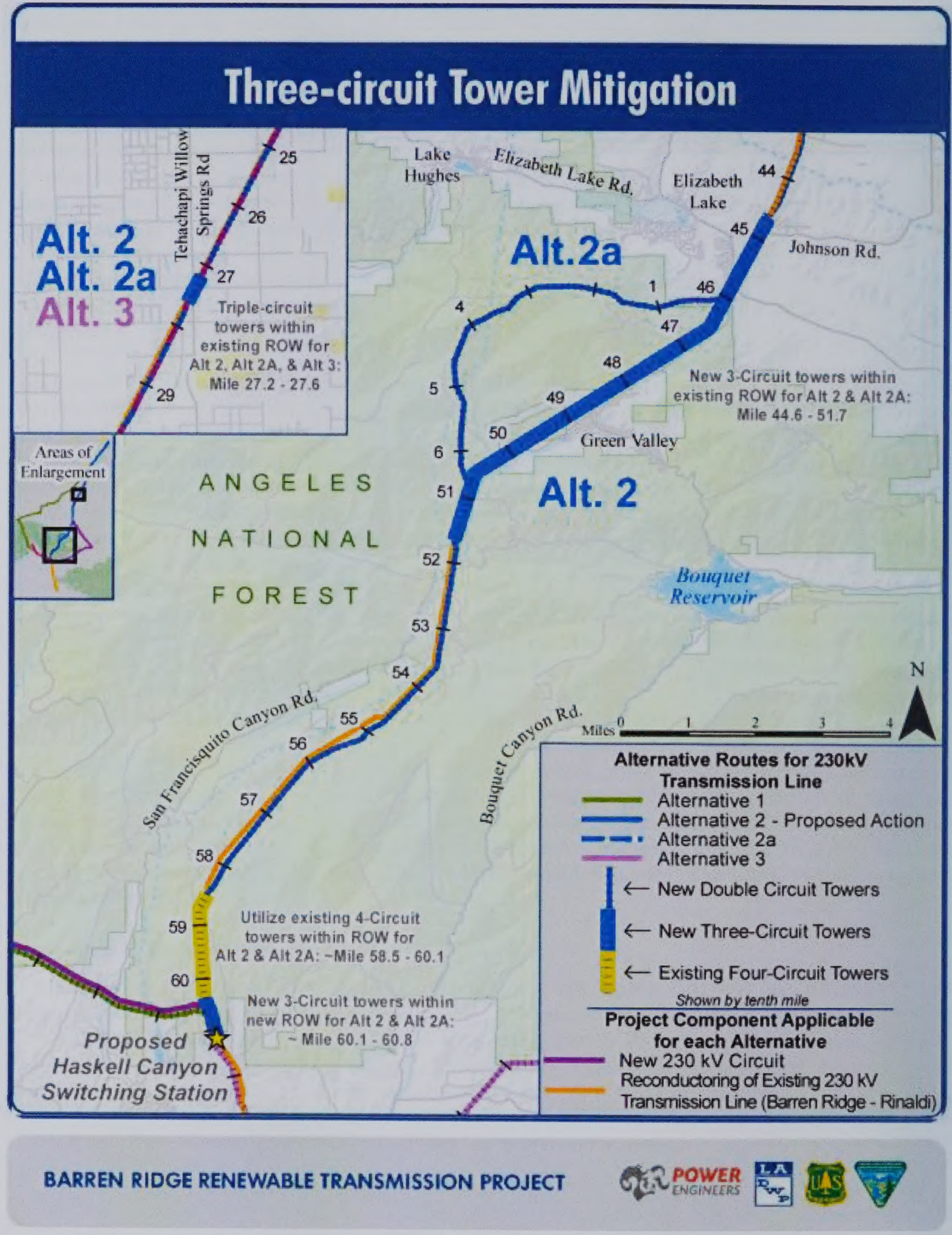

"DEADEND"
TOWER
"SUSPENSION"
TOWER

FIGURE 6. THREE-CIRCUIT TOWER MITIGATION


Three-circuit Tower Mitigation
Alt. 2
Alt. 2a
Alt. 3
Tehachapi Willow Springs Rd
25
26
27
29
Triple-circuit towers within existing ROW for Alt 2, Alt 2A, & Alt 3: Mile 27.2 - 27.6
Areas of Enlargement
Lake Hughes
Elizabeth Lake Rd.
Elizabeth Lake
Johnson Rd.
Alt.2a
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
1
4
5
6
New 3-Circuit towers within existing ROW for Alt 2 & Alt 2A: Mile 44.6 - 51.7
Green Valley
Alt. 2
ANGELES NATIONAL FOREST
Bouquet Reservoir
San Francisquito Canyon Rd.
Bouquet Canyon Rd.
Miles 0 1 2 3 4
N
Utilize existing 4-Circuit towers within ROW for Alt 2 & Alt 2A: ~Mile 58.5 - 60.1
New 3-Circuit towers within new ROW for Alt 2 & Alt 2A: ~ Mile 60.1 - 60.8
Proposed Haskell Canyon Switching Station
Alternative Routes for 230kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
← New Double Circuit Towers
← New Three-Circuit Towers
← Existing Four-Circuit Towers
Shown by tenth mile
Project Component Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

LADWP must maintain the electrical service along the existing BR-RIN transmission line to avoid impacts to the hydroelectric power plants north of the Barren Ridge Switching Station. Therefore, a temporary transmission line would be constructed to keep the BR-RIN circuit energized during construction of the three-circuit towers. After the temporary line is constructed, the existing BR-RIN single-circuit towers would be removed to allow the new three-circuit towers to be constructed within the existing ROW. Once construction of the three-circuit towers is completed, the temporary transmission line would be removed. The temporary transmission line is expected to be in place from six to nine months.

The temporary transmission line would be 7.5 miles long and would consist of wood and steel single poles with an average height of 95 feet, a 3-foot by 3-foot footprint, and an average of eight poles per mile. Construction would occur within a new temporary 80- to 100-foot ROW. The majority of the temporary transmission line would be constructed along San Francisquito Road. Portions would also be constructed along Elizabeth Lake Road and Johnson Road. Pole placement would be adjacent to public roadways wherever possible. If necessary, temporary ROW on private property would be needed where poles could not be placed within public road ROW. The majority of poles would be direct-embedded when set in place and would not require a permanent foundation. Where additional strength is necessary at larger angle points, steel poles would be required, which could require an excavation approximately 6 feet in diameter by 20 feet deep to accommodate the concrete pier foundation that would be cast in place. Once all the poles have been constructed and the conductor installed, the existing BR-RIN circuit would be connected into the temporary line and energized. The construction would require establishment of a staging area, work areas around poles, and pull and tension sites. Access to pole sites and pull and tension sites would be from the adjacent roadways.

Approximately seven miles of the existing BR-RIN single-circuit towers would be removed, with existing ROW utilized to access the existing towers. The new three-circuit towers would be placed within the existing ROW, utilizing existing access roads. Helicopter Mitigation, as described in this section below, would be applied in steeper terrain if additional access is required. The new three-circuit tower would require a 25-foot by 30-foot structure footprint and an average of seven structures per mile; the average structure height would be 170 feet, with a maximum tower-to-tower span length of 780 feet. The construction process for the new three-circuit towers would be the same as the double-circuit towers discussed above. After completion of construction of the three-circuit towers, the temporary transmission line would be removed and all temporary staging and work area land disturbances would be restored as close to previous conditions as possible and revegetated as required.

Helicopter Mitigation

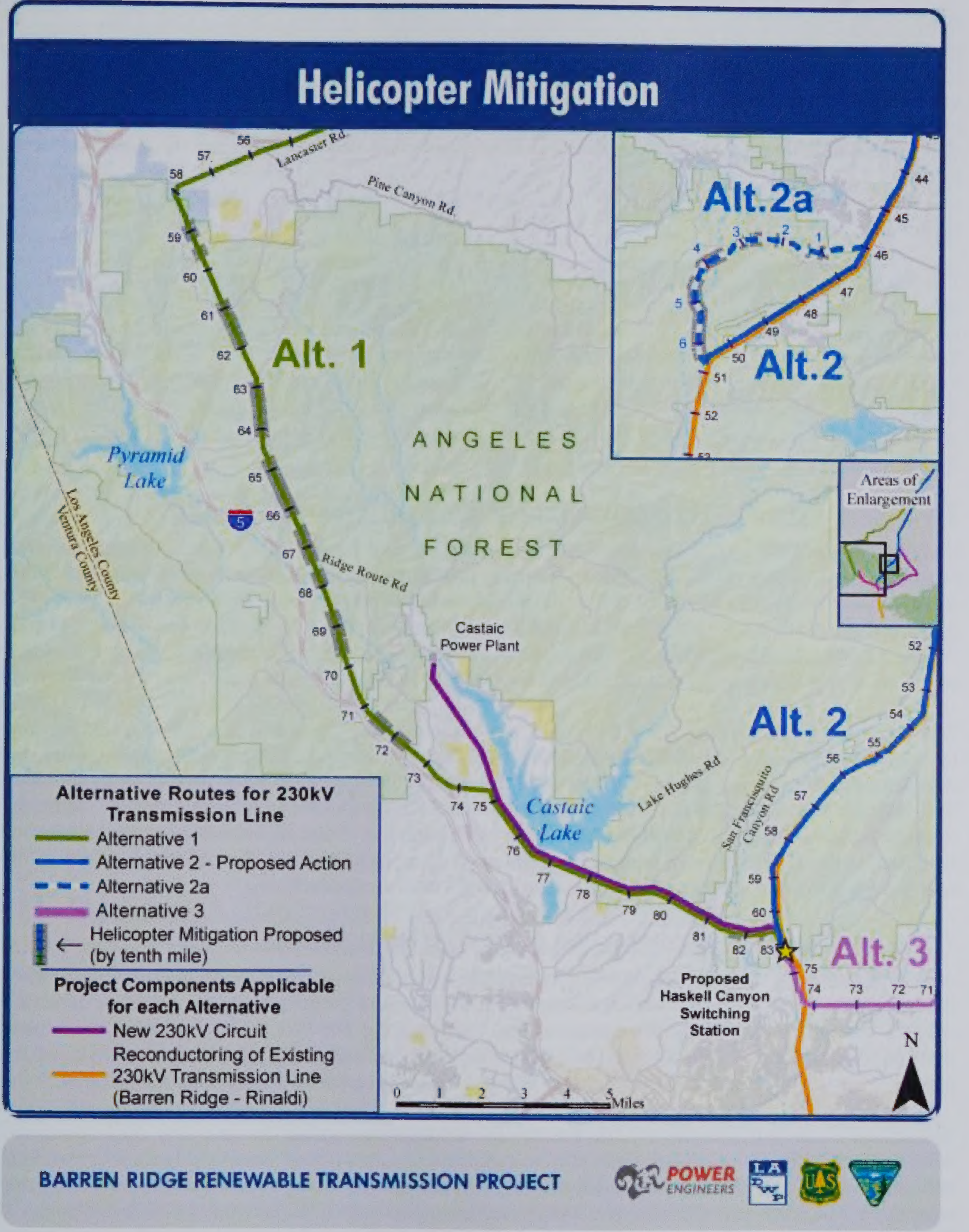
Within the ANF where the terrain is steep and access is limited, the Forest Service would require that the new double-circuit 230 kV structures be constructed with the use of helicopters (such as the Hughes 500 or Bell 212, or Sikorsky Skycrane). Although no specific locations for this mitigation have been identified for the Proposed Action (Alternative 2), as defined, it is expected the Forest Service would require the helicopter mitigation for construction in any area more than 300 feet from an existing road and with slopes greater than approximately 25 percent. Refer to Figure 7, the Identified Helicopter Mitigation Locations Map, which illustrates the identified locations for this mitigation. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. However, the following site and ground disturbing construction activities would be required to construct the new transmission line within the identified helicopter construction areas: portable landing pads, helicopter fly yards/staging areas and associated access roads, tower structure vegetation clearing, guard structures at major crossings, and access road pullouts.

Temporary 24-foot wide access roads would be required to access the helicopter fly yards/staging areas. The transmission line materials (tower steel, conductor reels, structure hardware, etc.) would be delivered by truck to the helicopter fly yards/staging areas. Vegetation clearing may be required at these sites to ensure safe working conditions. The fly yards/staging areas would serve as helicopter support yards for fueling and maintenance, as well as for the transport of materials and personnel. Towers may also be assembled in sections at these yards prior to delivery to the tower sites. Heavy lift helicopters would then fly the towers from the yards to the tower sites.

Portable landing pads would be located at each tower site. These pads would allow helicopters to load and unload personnel, tools, and equipment necessary for construction of foundations and assembly of tower structures. Helicopter-constructed towers that would not be in close proximity to existing access roads would utilize micropile foundations. For each tower leg, micropile foundations would use a group of three to eight 6- to 9-inch diameter casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth anywhere from one to eight feet below the ground surface, depending on the terrain.

Conductor installation would proceed in the same manner as the double-circuit tower installation. The equipment necessary for conductor installation would be large, heavy construction equipment that could only be brought in by truck. Some National Forest System (NFS) roads could need maintenance or improvement to allow pulling and tensioning, but no new access or spur roads would be created for conductor installation on the helicopter-constructed towers. After Project completion, any maintained access roads to helicopter fly yards/staging areas to would be reduced to 16 feet.

FIGURE 7. IDENTIFIED HELICOPTER MITIGATION LOCATIONS


Helicopter Mitigation
Alt. 1
Alt. 2
Alt.2
Alt.2a
Alt. 3
ANGELES NATIONAL FOREST
Pyramid Lake
Castaic Lake
Castaic Power Plant
Proposed Haskell Canyon Switching Station
Lancaster Rd
Pine Canyon Rd
Ridge Route Rd
Lake Hughes Rd
San Francisquito Canyon Rd
Los Angeles County
Ventura County
5
Areas of Enlargement
Alternative Routes for 230kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
Helicopter Mitigation Proposed (by tenth mile)
Project Components Applicable for each Alternative
New 230kV Circuit
Reconductoring of Existing 230kV Transmission Line (Barren Ridge - Rinaldi)
0 1 2 3 4 5 Miles
N
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2.1.2 Component 2 - Addition of New 230 kV Circuit

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures. The circuit would cross the unincorporated communities of Castaic and Saugus and the city of Santa Clarita. A total of 300 feet of BLM-managed public lands and four miles of NFS lands would be traversed; however, the new circuit would not require a new or additional ROW. This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (bundled 715.5 kcmil "Starling" ACSS/AW [aluminum conductor steel supported/aluminum-clad steel wire]) as that proposed for the new 230 kV transmission line between Barren Ridge and Haskell Canyon Switching Stations.

The addition of a new circuit on existing towers would require many of the same construction activities associated with a new transmission line (refer to Appendix B for a description of each construction activity). However, all work would be within existing ROW and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor. Specific towers requiring reinforcement would be determined following detailed design of the Project. Tower reinforcement would not alter the general design or the location of the structures. This process would generally include reinforced foundations or steel member replacements. Refer to Figure 1 for a map showing the location of the new 230 kV circuit.

2.1.3 Component 3 - Reconductoring of Existing Transmission Line

LADWP proposes the reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station to Rinaldi Substation. Four miles of BLM-managed public lands, 13 miles of NFS lands, and 44 miles of private property would be traversed. The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS (aluminum conductor steel supported/trapezoidal wires/high strength) conductor. The new conductor would have a larger diameter that allows for greater electrical capacity.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). Removal of the existing conductor would be used to string a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing 250-foot-wide ROW, with no additional ROW required. Some of the towers would need to be modified, replaced, and/or have foundations reinforced or replaced to carry the additional weight of the new heavier conductor. Refer to Figure 1 for the location of the reconductoring.

2.1.4 Component 4 - Construction of New Switching Station

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge – Haskell Canyon, existing Castaic – Northridge, Castaic – Sylmar, Castaic – Olive, and the proposed Castaic – Haskell Canyon). Refer to Figure 1 for the location of the new switching station.

The station would be approximately 500 feet by 600 feet to accommodate the necessary circuit positions, which are made up of equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide and would be enclosed by chain-link fencing with barbed-wire extension for security. The preliminary grading plan for the station is located in Appendix B.

Necessary pre-construction geotechnical investigation on-site would include six borings by a drill rig to investigate bedrock and soil stability and four cone penetration test locations after site grading to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. Construction would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut and fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. A 16-foot-wide paved road and a 100-foot by 100-foot gravel parking area would be required. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 120-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would be terminated into the switching station (i.e., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would need support and require the installation of galvanized steel structures. An existing 115 kV transmission line may need to be relocated around the proposed station. High-voltage bus work consisting of aluminum jumpers and tubing would be installed within the station.

2.1.5 Component 5 - Expansion of Existing Switching Station

LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet by 500 feet, for a total station size of 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and a drainage area. The preliminary design layout for the station may be found in Appendix B. Refer to Figure 1 for the location of the existing switching station.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station as described above. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Necessary pre-construction geotechnical on-site investigation would include two test pits excavated by a backhoe to investigate soil density and settlement, and four cone penetration test locations on-site to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

It is estimated that 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 90-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable-welding units, line trucks, and mechanic trucks would also be required. An estimated eight months with approximately 60 workers would be required to expand the station.

2.1.6 Project-Wide Mitigation Measures

To address potential impacts of the Proposed Project to multiple resource areas as discussed above, the following project-wide mitigation measure would be applied:

> Three-Circuit Tower Mitigation (THREE-CIRCUIT) – A three-circuit lattice tower design would be implemented as described in Section 2.1.1 of this report, at the locations shown in Figure 6, Three-Circuit Tower Mitigation Map.
>
> Helicopter Mitigation (HELICOPTER) – Helicopter Mitigation shall be implemented, as described in Section 2.1.1 of this report, in steep areas of the Angeles National Forest where access is limited. For Alternatives 1 and 2a, implementation would occur at the locations shown on Figure 7, Identified Helicopter Mitigation Map. During final design of the Project, areas other than those shown on Figure 7, including Alternatives 2 and 3, may potentially require helicopter construction of the towers. This determination would generally be made where tower sites have no existing access roads within 300 feet and slopes are greater than 25 percent. Final identification of these tower sites would be determined and agreed upon by the Forest Service, BLM and LADWP.

2.2 PROJECT COMPONENTS WITH ALTERNATIVES

2.2.1 Construction of New 230 kV Double-Circuit Transmission Line

BLM, the Forest Service, and LADWP identified the four Alternatives below to be carried forward and analyzed in the EIS/EIR, along with the No Action Alternative; they are illustrated in Figure 1. The three action alternatives are evaluated in this biological evaluation.

No Action Alternative

The No Action Alternative is required by NEPA and CEQA. Under the No Action Alternative, the construction of the new 230 kV transmission line, addition of a new circuit on existing structures from Haskell Canyon to the Castaic Power Plant, reconductoring of the existing BR-RIN 230 kV transmission line, construction of a Haskell Canyon Switching Station, and expansion of the existing Barren Ridge Switching Station would not occur. However, current operations and maintenance activities for the existing LADWP facilities would continue to occur as they are currently permitted.

Alternative 1

The new 230 kV transmission line for Alternative 1 would be 83 miles long and run from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station, and is the westernmost alternative. The addition of 12 miles of a new 230 kV circuit from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would parallel the new 230 kV transmission line for eight miles. Reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line would occur in a separate utility corridor. Alternative 1 has the potential to impact portions of unincorporated Kern and Los Angeles Counties; the communities of Holiday Valley Estates, Castaic, and Saugus; and Cities of Mojave, Santa Clarita, and Los Angeles. Eight and a half miles of the new transmission line would be constructed by helicopter.

Alternative 2 (LADWP's Proposed Action and Federal Agency Preferred Alternative)

The new 230 kV transmission line for Alternative 2 would be 61 miles long, and run from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station, paralleling LADWP's existing BR-RIN 230 kV transmission line for the entire length. The existing BR-RIN would be reconductored as part of the Project and, for approximately 1.5 miles, the two new 230 kV circuits would be placed on existing four-circuit structures that are located just north of the proposed Haskell Canyon Switching Station. Impacts would be concentrated along this utility corridor and have the potential to affect portions of unincorporated Kern and Los Angeles Counties; the communities of Willow Springs, Antelope Acres, Elizabeth Lake, Green Valley, and Saugus; and Cities of Mojave, Santa Clarita, and Los Angeles. The addition of a new 230 kV circuit from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would occur in a separate utility corridor from that of the new 230 kV transmission line.

Alternative 2a

Alternative 2a's new 230 kV transmission line from Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station would be 63 miles long, and very similar to Alternative 2. They share the same proposed alignment for 56 miles, but seven miles would be re-routed around Green Valley and would create a new utility corridor through the ANF. The same communities as Alternative 2 would be potentially impacted.

Alternative 3

The new 230 kV transmission line for Alternative 3 would be 76 miles long and is the easternmost alternative. Approximately 38 miles of Alternative 3's northern alignment would parallel the reconductoring of BR-RIN, and impacts would be concentrated within the same corridor. Thirty-four miles of the southern portion of the Alternative would be placed in a separate utility corridor from the reconductoring; 11 miles of Alternative 3 would not be within an existing LADWP corridor. The installation of a new 230 kV transmission circuit would be placed on existing structures and not share a corridor with the new double-circuit 230 kV transmission line from Barren Ridge Switching Station. Alternative 3 has the potential to impact portions of unincorporated Kern and Los Angeles Counties; communities of Willow Springs, Leona Valley, Antelope Acres, Agua Dulce, Castaic and Saugus; and Cities of Mojave, Lancaster, Palmdale, Santa Clarita, and Los Angeles. Of all the Alternatives, this Alternative would have the potential to impact the most areas since the three Project components would be located in three separate areas.

2.3 GENERAL PRACTICES AND MITIGATION MEASURES

The following tables describe proposed General Practices (GPs) and mitigation measures to reduce the impact of effects that may be generated by construction of the BRRTP. These apply to preconstruction, construction, and post-construction aspects of the Project. Both the GPs and mitigation measures are considered to be part of the Project description for any Alternative that is chosen. The GPs were written for all resources of the Project. Because not all of these are applicable to biology, ones that do not apply to biology have been removed and show "*not applicable*" in the table below. The entire list can be viewed in the BRRTP Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) (USFS, BLM, and LADWP 2011b).

The mitigation measures are specific to biology and are in response to various impacts that could occur to vegetation, wildlife, and/or habitat. Impacts BIO-9, *The Project could potentially affect wildlife movement corridors and disturb wildlife movement*, and BIO-10, *The proposed Project may result in edge-associated impacts*, and BIO-12, *Indirect impacts to wildlife species,* do not have respective mitigation measures.

TABLE 1. GENERAL PRACTICES

	Plans
GP-1	**Plan of Development & Construction, Operation and Maintenance Plans.** In consultation with the Forest Service and BLM Authorizing Officers prior to construction, LADWP shall develop a Construction, Operation and Maintenance Plan (COM Plan) with the Forest Service and Plan of Development (POD) with BLM. These plans shall be attached to and become a part of the Special Use and Right-of-Way Authorizations. The COM Plan and POD shall include, at a minimum, road maintenance specifications, vegetation treatment and rehabilitation specifications, and conditions on maintenance and replacement of improvements. The agencies may combine the POD and COM plans into a single document for the Project.
GP-2	**Traffic Control Plan.** Prior to the start of construction, LADWP shall submit a Traffic Control Plan (TCP) to agencies with jurisdiction over public roads that would be directly affected by construction activities (where road closures or encroachments would be necessary). The Plan shall define the locations of all roads that would need to be temporarily closed due to construction activities, and also define the use of flag persons, warning signs, lights, barricades, cones, etc. for each construction closure. The plan shall include measures to avoid disruptions or delays in access for emergency service vehicles and to keep emergency service agencies informed of road closures, detours, and delays. Police departments, fire departments, ambulance services, and paramedic services shall be notified in advance of each closure by LADWP. The Plan shall also include contact information for those agencies, assign responsibility for notifying the service providers, and specify coordination procedures. Copies of the Plan shall be provided to all affected police departments, fire departments, ambulance and paramedic services.
GP-3	**Hazardous Materials/Waste Management Plan.** A project-specific hazardous materials management and hazardous waste management program will be developed prior to initiation of the project. The program will outline proper hazardous materials use, storage and disposal requirements as well as hazardous waste management procedures. The program will identify types of hazardous materials to be used during the project and the types of wastes that will be generated. All project personnel will be provided with project-specific training. This program will be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes will be handled and disposed of according to applicable rules and regulations. Employees handling wastes will receive hazardous materials training and shall be trained in hazardous waste procedures, spill contingencies, waste minimization procedures and Treatment, Storage and Disposal Facility (TSDF) training in accordance with OSHA Hazard Communication Standard and 22 CCR. If degraded soil or groundwater is encountered during excavation (e.g., there is an obvious sheen, odor, or unnatural color to the soil or groundwater), it shall be excavated, tested, and disposed of in accordance with state hazardous waste disposal requirements. The Plan shall also include procedures detailing emergency responses to releases of hazardous materials. It will prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, will be immediately reported to the appropriate agency as outlined in the Plan if the spill has entered a navigable water, stream, lake, wetland, or storm drain, if the spill impacted any sensitive area including conservation areas and wildlife preserves, or if the spill caused injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, will be aware of state and federal emergency response reporting guidelines.
GP-4	**Health and Safety Plan**. A Health and Safety Plan shall be prepared and implemented. The Plan shall address emergency medical services available on-site and within the project area. The Plan shall also address specific emergency response and evacuation measures.
GP-5	**Stormwater Pollution Prevention Plan.** A project-specific Construction Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented prior to the start of construction. The SWPPP will utilize Best Management Practices (BMPs) to address the storage and handling of hazardous materials and sediment runoff during construction activities.

GP-6	**Spill Prevention, Countermeasure, and Control Plan.** LADWP will prepare or update existing Spill Prevention, Countermeasure, and Control Plan (SPCC Plan) for proposed and/or expanded switching stations if necessary or required by EPA guidelines. The plans will include engineered and operational methods for preventing, containing, and controlling potential fluid releases, and provisions for quick and safe cleanup.
GP-7	**Soil Management Plan.** A Soil Management Plan will be developed and implemented for construction of the proposed Project. The objective of the Soil Management Plan is to provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities. The plan will include practices that are consistent with California Title 8, Occupational Safety and Health Administration (Cal-OSHA) regulations, as well as appropriate remediation standards that are protective of the planned use. The Plan will provide guidelines for identification of impacted soil, assessing impacted soil, soil excavation, impacted soil storage, verification sampling, and impacted soil characterization and disposal. In the event that potentially contaminated soils are encountered within the footprint of construction, soils will be tested and stockpiled. The appropriate Certified Unified Program Agency (CUPA) will determine whether further assessment is warranted.
GP-8	**Avian Protection Plan.** An Avian Protection Plan (APP) shall be developed and implemented for the construction and operation of the Project. The APP will outline measures and protocols that will be undertaken to protect avian species and is intended to protect local and migratory bird species that may occur within the Project area.
	Design
GP-9	A "dulled" metal finish shall be used on new towers or rebuilt portions of existing towers to reduce visual impacts except where otherwise dictated by visual mitigation measures.
GP-10	Nonspecular conductors shall be used to reduce visual impacts.
GP-11	Project features will be placed so as to avoid sensitive features including, but not limited to, riparian areas, water courses, and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower design. This will minimize the amount of sensitive features disturbed and/or reduce visual contrast.
GP-12	Drainage control features will be installed, as appropriate, to minimize the amount of stormwater flow from areas of active construction. Details would be described in the SWPPP.
	Construction Vehicles/Equipment
GP-13	Only clean-burning on-road and off-road diesel engines shall be used. Where feasible, heavy-duty diesel powered construction equipment manufactured after 1996 (with federally-mandated "clean" diesel engines) shall be used.
GP-14	Construction workers shall carpool to and from the construction site when possible.
GP-15	All trucks hauling soils or other loose materials shall be covered, or maintain at least two feet of freeboard (distance between the material and the top of the truck).
GP-16	Where visible soil material is carried onto adjacent public streets, the affected streets shall be cleaned daily with water sweepers.
GP-17	All vehicles and equipment operating within 100 feet of an active stream will be inspected daily to ensure they are free of any leaks of fuel, cooling, or lubricating fluids.
GP-18	All construction vehicles shall maintain a hazardous materials spill kit, which shall include absorbent materials, tarps, small storage containers or waterproof bags, and latex gloves. Field personnel shall be made aware of these kits and instructed on how to use them.
GP-19	Refueling, or addition or changing of oil and other fluids for equipment and heavy machinery shall be performed only at approved staging and construction yards. Staging and construction yards will be located on upland sites and spill containment measures will be used to minimize risk of spill or drainage into waterways. Oil and other fluids will be disposed of as required by California law. Emergency refueling, or emergency addition or changing of oil or other fluids shall not be performed within 500 feet of natural stream channels or wetlands.
GP-20	Helicopters utilized for construction will be refueled at helicopter staging areas or local airports. Procedures will include the use of drop cloths made of plastic and drip pans and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas will be located in designated areas where absorbent pads and trays are available.
GP-21	LADWP shall contact Angeles National Forest (ANF) dispatch seven days prior to helicopter use and shall provide ANF with radio frequencies being used by the aircraft, aircraft identifiers, the number of helicopters that will be used while working on National Forest System (NFS) lands at any given time, and the flight pattern of helicopters used on NFS lands. If a wildfire occurs in the Project area, upon contact from the Forest Aviation Officer, helicopters in use by LADWP shall immediately cease construction activities and not restart aerial operations until the Forest Aviation Officer provides clearance.

GP-22	The Applicant shall clear brush and dead and decaying vegetation that would pose a fire hazard from the work area prior to starting construction and/or maintenance work. The work area includes areas of construction (e.g., tower sites, switching station site) within the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. Cleared vegetation shall either be removed or chipped and spread onsite in piles no higher than six inches. This will be determined in consultation with individual appropriate land management agencies.
	Access Roads
GP-23	The alignment of any new access roads or overland routes shall follow the designated area's landform contours where possible, providing that such alignment does not additionally impact resource values.
GP-24	To the extent practical, any re-grading of access roads shall be the minimum necessary to provide safe access of construction equipment, and erosion control measures.
GP-25	Construction vehicles shall use paved roads to access the construction site when available.
GP-26	The design and use of roadways or access trails within the ANF shall be coordinated with the District and Forest Supervisor's office. The ANF may specify conditions under which use of the Forest system roads and lands shall be permitted. These conditions may include restoring or blocking access at some service trails and repairing any roadway damage or erosion damage caused by construction activities or traffic. Any project-related damage to existing Forest system roads shall be repaired at LADWP's cost.
GP-27	Any construction or installation work requiring the crossing of a roadway or railway right-of-way would incorporate the use of guard poles, netting, or similar means to protect moving traffic and structures from the activity. If necessary on state highways, continuous traffic breaks would be planned and provided.
GP-28	To minimize traffic congestion and delays during construction to the extent feasible, LADWP shall restrict all necessary lane closures or obstructions on major roadways associated with Project construction activities to off-peak periods, as feasible. Lane closures should be avoided during the 6:00 a.m. to 9:00 a.m. timeframe and the 3:30 p.m. to 6:30 p.m. timeframe, or as otherwise defined within the TCPs.
GP-29	Where Project construction and/or maintenance access could close one or multiple lanes, and where significant degradations in roadway operations could result, roadway diversions should be provided to restore the travel lanes through temporary roadway restriping.
GP-30	Where Project construction and/or maintenance access could close bicycle lanes or trails, temporary diversions should be provided where feasible to provide continued access around the construction or maintenance area.
GP-31	Where Project construction and/or maintenance access could cut-off access to nearby recreation areas, and where no alternate route exists to the recreation areas, measures should be used to provide a minimum of one lane reversible access (with flagmen) through the construction/maintenance area, or work should only be conducted during off-peak hours or evening hours only.
GP-32	Any damage to local paved roadways caused by Project construction and/or maintenance should be repaired and the roadways should be restored to their previous condition.
GP-33	In areas where soils and vegetation are particularly sensitive to disturbance, existing access roads would be repaired only in areas where they are otherwise impassable or unsafe.
	Construction Areas
GP-34	Construction activities shall be limited to the designated right-of-way and approved access and work areas as identified in the ROD and POD. Any deviations from the approved areas must be cleared with the jurisdictional agency and/or landowner.
GP-35	Grading areas shall be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.
GP-36	No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits.
GP-37	In construction areas (e.g., marshalling yards, tower sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration shall occur as required by the landowner or land management agency. The method of restoration will normally consist of returning disturbed areas back to their natural contour, reseeding, installing cross drains for erosion control as necessary, placing water bars in the road as necessary, and filling ditches.
GP-38	Soil excavated from construction activities shall not be left at work areas where the slopes exceed 10 percent or where the work area is within 100 feet of a natural stream or waterbody (receiving water). In these situations, loose soil shall be used elsewhere within the immediate area or stockpiled at the staging area. Stockpiled soil shall be managed as required by the SWPPP. No stockpiling or spreading of soil or other materials shall occur within stream channels.

GP-39	During grading or excavation work for the Project, the contractor shall observe the exposed soil for visual evidence of contamination. If visual contamination indicators are observed during construction, the contractor shall stop work until the material is properly characterized and appropriate measures are taken to protect human health and the environment. The contractor shall document the exact location of the contamination and shall immediately notify a designated Environmental Monitor and propose actions for addressing the contamination in accordance with the Soil Management Plan.
GP-40	Existing watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) will be repaired or replaced, if they are damaged or destroyed by construction activities, to their pre-disturbed condition as required by the landowner or land management agency.
GP-41	Allow natural vegetation to reoccur on temporarily disturbed areas following the completion of construction.
GP-42	Weed control measures on non-federal lands shall be implemented as determined in consultation with CDFG,, and the Counties of Los Angeles and Kern Agricultural Commissions.
GP-43	Every effort will be made to minimize vegetation removal and permanent loss at construction sites. Native vegetation will be flagged for protection or stockpiled for recontouring use at the discretion of the Biological Monitor and the Construction Supervisor.
GP-44	In construction areas where recontouring is not required, vegetation will be left in place wherever possible and the original contour will be maintained to avoid excessive root damage and allow for resprouting. Disturbance will be limited to overland driving where feasible to minimize changes in the original contours.
GP-45	Use of heavy equipment within a flowing channel will be avoided if possible; however, should it be necessary, the Environmental Monitor will be notified prior to initiation of construction activities to allow adequate time for site visits and surveys, if necessary.
GP-46	Asphalt or cement equipment will not be rinsed in, nor excess products deposited into any stream or other waterway. Asphalt or concrete effluent will not be allowed to enter into stream or RCA. Effluent will be removed from standing water and prevented from entering a waterway.
GP-47	Fill material, including brush, loose soils, and other similar debris will not be deposited within a stream channel or on a stream bank.
	Surveys/Monitoring
GP-48	Biological Monitor. For areas identified as environmentally sensitive, such as streams, wetlands, riparian areas, and other environmentally sensitive areas, a biological monitor shall be present during ground disturbing construction activities. The qualified biologist shall conduct monitoring for any area subject to disturbance from construction activities that may impact biological resources. The biological monitor's duties include minimizing impacts to special-status species, native vegetation, wildlife habitat, and unique resources, as well as to identify potential issues or impacts to biological resources and report those to the authorized biologist.. Where appropriate, the monitor will flag the boundaries of biologically sensitive areas and monitor any construction activities in these areas to ensure that ground disturbance activities and impacts occur within designated limits.
GP-49	Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) will be implemented to educate all construction personnel of the area's environmental conditions and the environmental protection measures that must be adhered to. An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, protection of biological and cultural resources, and proper Best Management Practice (BMP) implementation, to all construction and maintenance personnel.
	Coordination/Permits
GP-50	Prior to construction, LADWP shall consult with all federal, state, and local agencies, including local agency consortiums, having jurisdiction over lands affected by the proposed Project's ROW and ancillary facilities to ensure that no permanent restrictions or preclusions of their land management practices occur.
GP-51	Construction activities shall be designed to minimize work on or use of local streets. In the event that local streets must be used for more than normal traffic purposes, an encroachment permit or similar authorization shall be obtained from the County (or other agency, as applicable). Any work requiring an encroachment permit shall include preparation of a traffic control plan or other management plan to minimize effects on local streets. Any damage to local streets will be repaired, and the street system will be restored.
GP-52	Consistent with Los Angeles County Code (Section 12.08.440), no construction activities shall occur in a residential area between 7:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or at any time on Sundays or holidays. In the event that construction needs to occur outside the specified hours, a variance shall be obtained beforehand.

GP-53	Incorporate riparian area avoidance and permit measures. The following actions and all permit conditions detailed within the individual or Nationwide 404 permit and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). Before construction, qualified resource specialists would stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones would include a 10-foot buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities would be restricted from these zones, although essential vehicle operation and foot travel would be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities would be prohibited within the exclusion zone. In areas where riparian habitats are unavoidable, the construction manager in consultation with the lead environmental compliance inspector would narrow the width of the centerline to the maximum extent allowable. New spur roads and existing access road improvements would be constructed and implemented using methodology that preserves existing hydrology. Tower pad clearance would be minimized to the maximum extent allowable. All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities would be restored to ensure no net loss of habitat functions and values. Following construction activities, the areas would be restored as soon as practicable.
GP-54	Construction crews will avoid impacting the streambeds and banks of any streams along the route to the extent feasible. When construction or maintenance work affects the bed, bank or margins of a stream under CDFG jurisdiction, LADWP will notify CDFG as required under Fish and Game Code Section 1602, which may include securing a Streambed Alteration Agreement.
GP-55	Local emergency service providers shall be coordinated with to ensure that construction activity and any associated lane closures or traffic impacts will not significantly affect emergency response vehicles.
GP-56	LADWP would obtain appropriate Tree Removal Permits when necessary from the appropriate government agencies. In accordance with the obtained permits, LADWP shall avoid or minimize impacts to protected trees.
GP-57	LADWP shall obtain permits/approvals from any affected railway operators to ensure construction activities comply with each company's safety requirements and to avoid disruption to or congestion of rail traffic.
GP-58	LADWP shall coordinate with the City of Santa Clarita at least 30 days prior to construction in the service territory to reduce the potential interruption of bus transit services.
GP-59	All residences adjacent to the project area shall be notified at least seven days in advance of local construction of the construction schedule and the type and expected duration of local impacts, including air quality and noise impacts. The notice shall also include a phone number for construction noise questions.
Noise	
GP-60	Noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer shall be used on construction equipment.
GP-61	Temporary sound walls or acoustic blankets around stationary noise sources (e.g., generators, pumps) shall be installed to shield adjacent sensitive receptors. Where feasible, these sound walls or acoustic blankets shall have a height of no less than eight feet, a Sound Transmission Class (STC) of 27 or greater, and a surface with a solid face from top to bottom without any openings or cutouts.
GP-62	Unnecessary construction vehicle idling time shall be minimized (see also Mitigation Measure AIR-2D, Restrict diesel engine idling to 5 minutes). The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. A "common sense" approach to vehicle use shall be applied; if a vehicle is not required for use immediately or continuously for construction activities, its engine shall be shut off. It should be noted that certain equipment, such as large diesel-powered vehicles, shall require extended idling for warm-up and repetitive construction tasks and would therefore not be subject to being shut off when not in use.

TABLE 2. PROPOSED BRRTP MITIGATION MEASURES

Mitigation Measure	Description
BIO-1	*Provide restoration/compensation for impacted sensitive vegetation communities.* **1a** The intent of this mitigation measure is to require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF) Land Management Plan (LMP). Before construction LADWP shall have a qualified biologist, where concurrence on the biologist has been provided by the USFS and approval on the biologist has been provided by the BLM, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees will be documented by identifying the species, number, location, and diameter at breast height (DBH). On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. 1) For NFS and BLM lands, the USFS and BLM shall review and approve a Habitat Restoration and Revegetation Plan, prepared by LADWP in coordination with the federal agencies, for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-federal lands, LADWP shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for topsoil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bare-root or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program;(j) locations and impacts to all oaks and native trees (over 3 inches DBH); (k) locations of temporary or permanent gates, barricades, law enforcement patrolling, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (NFS and BLM lands only). Restoration efforts will not adversely affect listed species or critical habitat and measures will be implemented to protect these species during restoration. 2) LADWP shall utilize a USFS/BLM approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All areas dominated by non-native species before Project disturbance shall be revegetated using appropriate native species. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc. will be accepted without the approval of the USFS and BLM on NFS/BLM lands, and seeds must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-Project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring reporting will be yearly from years one to five and every other year from years six to ten or until the success criteria are met. LADWP shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the ANF LMP. If the survival and cover requirements have not been met, LADWP is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned. 3) On NFS land, the USFS/LADWP will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees (over 3 inches DBH) in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location, and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes, shall not occur until the trees are evaluated by a USFS botanist or authorized arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or adding spoil around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be replaced at the rate appropriate to the DBH.

Mitigation Measure	Description
	4) The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks that are to be removed on the ANF shall be as follows: trees from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following California Department of Fish and Game (CDFG) guidelines. On the ANF, any oak or native tree that must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated (off-site) at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by an authorized arborist and USFS botanist. On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.
	5) Permanent impacts on federal lands shall be determined by the appropriate federal manager (USFS and BLM) at the ratios stated below (Table BIO-MM-1) or at a comparable value. On NFS and BLM lands, impacts will be considered permanent if the trees are not likely to recover by ten years post-disturbance. Where on-site restoration is planned for mitigation of temporary impacts to vegetation communities, LADWP shall identify a Habitat Restoration Specialist, where concurrence has been provided by the USFS, to implement the method of restoration outlined by the USFS/BLM in the Habitat Restoration Plan.
	6) On USFS/BLM lands, the creation or restoration of habitat shall be monitored after mitigation site construction to assess progress and identify potential problems with the restoration site. This will be monitored on USFS/BLM lands until the success criteria outlined in the restoration plan are met annually for years one to five, and bi-annually for years six to ten. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken until the success criteria are met as specified above, to ensure the success of the restoration effort. If the mitigation fails to meet the established success criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the USFS/BLM (as appropriate). If a fire occurs in a revegetation area before the success criteria are met, LADWP shall be responsible for a one-time replacement of vegetation. If a second fire occurs, no replanting is required, unless the fire is caused by LADWP activity. Off-site mitigation for NFS/BLM and non-NFS/BLM lands may be required if mitigation rates exceed what can be achieved on NFS/BLM land. This may be in the form of funding for land acquisition for inclusion into the Angeles National Forest or BLM lands affected by the Project, mitigation banking, removing existing structures, or comparable restoration efforts.
	1b During and after construction, USFS/BLM-identified potential or existing entrances to Project-related disturbed areas such as access/spur roads, pull sites, staging areas, fly yards, landing zones, etc. on NFS/BLM lands shall be gated, blockaded and/or concealed in some manner and maintained to prevent the unauthorized use by the general public. Signs prohibiting unauthorized use of these disturbance areas shall be posted on these barricades if deemed necessary by the USFS/BLM. If barricades are being compromised, law enforcement patrolling may also be implemented to control unauthorized access onto Project disturbance areas.
	1c Treat cut tree stumps with Sporax. All stumps of trees (conifers and hardwoods) resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the USFS.

TABLE BIO-MM-1. SUMMARY OF ESTIMATED IMPACTS TO VEGETATION COMMUNITIES ON FEDERAL LANDS

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Alternative 1								
Chamise Chaparral	USFS	16.73	3:1	50.19	56.06	1:1	56.06	106.25
Mojave Creosote Bush	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Scrub								
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.30
Riversidian Sage Scrub	USFS	3.06	5:1	15.3	10.48	2:1	20.96	36.26
Southern Coast Live Oak Riparian Forest	USFS	0.05	5:1	0.25	0.38	2:1	0.76	1.01
Southern Cottonwood Willow Riparian Forest	USFS	0.42	5:1	2.1	0.86	2:1	1.72	3.82
Southern Mixed Chaparral	USFS	14.13	3:1	42.39	45.81	1:1	45.81	88.20
Southern Sycamore Alder Riparian Woodland	USFS	0.13	5:1	0.65	0.25	2:1	0.5	1.15
Southern Willow Scrub	USFS	0.32	3:1	0.96	1.30	2:1	2.6	3.56
Alternative 2								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	7.8	1:1	7.8	24.8	1:1	24.8	32.6
Mojave Creosote Bush Scrub	BLM	2.69	1:1	2.69	21.82	1:1	21.82	24.51
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.06	1:1	2.06	2.31
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.39	2:1	6.78	10.23
Southern Mixed Chaparral	USFS	3.24	3:1	9.72	8.77	1:1	8.77	18.49
Southern Riparian Scrub	USFS	0.33	3:1	0.99	0.66	1:1	0.66	1.65
Southern Sycamore Alder Riparian Woodland	USFS	0.87	5:1	4.35	2.2	2:1	4.4	8.75
Alternative 2a								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	3.24	1:1	3.24	12.72	1:1	12.72	15.96
Interior Live Oak Chaparral	USFS	2.06	5:1	10.3	5.60	2:1	11.2	21.5
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Scrub Oak Chaparral	USFS	1.46	5:1	7.3	3.19	2:1	6.38	13.68
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.40	2:1	6.8	10.25
Southern Mixed Chaparral	USFS	9.03	3:1	27.09	27.88	1:1	27.88	54.97
Southern Riparian Scrub	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland	USFS	0.81	5:1	4.05	1.64	2:1	3.28	7.33
Alternative 3								
Chamise Chaparral	BLM	0.00	1:1	0.0	0.02	1:1	0.02	0.02
Barren/developed	USFS	1.04	1:1	1.04	2.13	1:1	2.13	3.17
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	9.57	5:1	47.85	28.19	2:1	56.38	104.23
Scrub Oak Chaparral	USFS	2.87	5:1	14.35	5.83	2:1	11.66	26.01
Southern Riparian Scrub	USFS	0.34	5:1	1.7	0.69	2:1	1.38	3.08
New Circuit								
Chamise Chaparral	USFS	8.03	3:1	24.09	23.05	1:1	23.05	47.14
Riversidian Sage Scrub	BLM	0.04	1:1	0.04	0.34	1:1	0.34	0.38
Riversidian Sage Scrub	USFS	1.98	5:1	9.9	5.96	2:1	11.92	21.82
Southern Coast Live Oak Riparian Forest	USFS	0.08	5:1	0.4	0.66	2:1	1.32	1.72
Southern Cottonwood Willow Riparian Forest	USFS	0.40	5:1	2.0	0.80	2:1	1.6	3.6
Southern Sycamore Alder Riparian Woodland	USFS	0.09	5:1	0.45	0.19	2:1	0.38	0.83

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Reconductoring								
Chamise Chaparral (Segment ABG)	USFS	16.07	3:1	48.21	32.65	1:1	32.65	80.86
Barren/developed (Segment ABG)	USFS	7.77	1:1	7.77	25.28	1:1	25.28	33.05
Mojave Creosote Bush Scrub (Segment ABG)	BLM	2.85	1:1	2.85	23.16	1:1	23.16	26.01
Mojave Wash Scrub (Segment ABG)	BLM	0.23	1:1	0.23	1.86	1:1	1.86	2.09
Riversidian Sage Scrub (Segment ABG)	USFS	5.07	5:1	25.35	10.30	2:1	20.6	45.95
Southern Coast Live Oak Riparian Forest (Segment ABG)	USFS	3.25	5:1	16.25	6.60	2:1	13.2	29.45
Southern Mixed Chaparral (Segment ABG)	USFS	2.86	3:1	8.58	8.01	1:1	8.01	16.59
Southern Riparian Scrub (Segment ABG)	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland (Segment ABG)	USFS	0.95	5:1	4.75	2.34	2:1	4.68	9.43
Southern Coast Live Oak Riparian Forest (Segment K)	BLM	0.02	1:1	0.02	0.04	1:1	0.04	0.06
Southern Mixed Chaparral (Segment K)	BLM	0.00	1:1	0.0	0.01	1:1	0.01	0.01

Note: The permanent and temporary impact calculations provided above are estimates based on the impact model described in Appendix C of the Biological Resources Technical Report. Therefore, acreage numbers for the habitat types listed above may be smaller than those listed in the table. Preconstruction surveys will be conducted to estimate the acreage impacts and will be based on the final design not the impact model.

Mitigation Measure	Description
BIO-2	*The following prescriptions would prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.* 2a **Prepare and implement a Weed Control Plan.** LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. The Weed Control Plan, including monitoring and eradication, will be part of the 50 year Operations and Maintenance Permit. On ROW easement lands administered by the USFS/BLM, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations including consulting with CDFG on CESA species. The Weed Control Plan shall be submitted to the USFS/BLM for final authorization of weed control methods, practices, and timing before implementation of the Weed Control Plan on public lands. Weed control on BLM lands using pesticides would require site-specific NEPA analysis and an approved BLM Pesticide Use Permit. Pesticide Use Permits are issued for a maximum of three years. ROW easements on private lands shall include provisions such as wheel and equipment washing as part of implementation of the Weed Control Plan. The Weed Control Plan shall include the following stipulations: 1) A pre-construction weed inventory shall be conducted on NFS and BLM lands by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006); (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the USFS and/or BLM as species of priority (for NFS/BLM lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated before construction according to control methods and practices for invasive weed populations designed in consultation

Mitigation Measure	Description
	with the USFS/BLM. The Weed Control Plan shall be updated and guide post-construction eradication and monitoring efforts. 2) Weed control treatments shall include all legally permitted herbicide application, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all State and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator. The most effective herbicides with the least toxic surfactant available shall be used. Herbicides shall not be applied during or within 24 hours of a 70% chance of occurring rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used. Herbicides shall not be applied by spray equipment when wind velocities exceed 6 mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied at wind speeds over 15 mph. In areas containing special-status plants or animals, there will be a 5- to 70-foot buffer where herbicides are not used. The size of the buffer will be determined and flagged for avoidance by an approved botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of adjacent native species, herbicide being used, method of herbicide application, concentration of herbicide being used based on no observed effect to non-target species, and/or environmental conditions and terrain. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds. Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by an authorized botanist. For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows. 3) On the ANF and BLM lands, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten, or until success criteria as outlined in the Weed Control Plan are met. Treatment of all identified weed populations shall occur at an appropriate interval so as to meet the success criteria. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that site. 4) During Project preconstruction and construction, all seeds and straw materials shall be weed-free when available, and all gravel and fill material shall be certified weed-free by the county Agriculture Commissioners' Offices. Any deviation from this must be approved by a USFS/BLM botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the USFS/BLM. 5) Before beginning preconstruction activities, the USFS and the BLM, in coordination with LADWP, will determine suitable locations to install field washing stations as part of the Weed Control Plan. Before commencing construction activities, LADWP shall document that all vehicles, equipment, and tools used on the Project have been cleaned at existing construction yard wash facilities or legally operating car washes. This is a one-time requirement designed to address the potential of new species of weeds being transported from outside the area. If, however, vehicles, equipment, or tools are used or driven off paved roads on non-NFS/BLM lands, washing must occur before entering USFS/BLM lands. During Project preconstruction and construction, all vehicles, equipment, or tools which will be used outside of permitted Project roadways shall be washed at the nearest wash station before operating off-road. In other areas also designated by the USFS/BLM, vehicles, equipment, and tools will be washed at the nearest wash station after exiting those areas. Vehicles that do not leave permitted Project roadways are not required to be washed after the initial washing described above. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the USFS/BLM. For NFS lands, plant material may also be removed by air compressors at USFS botanist/LADWP-approved locations.

Mitigation Measure	Description
	Written daily logs shall be kept for all vehicle/equipment/tool washing that records the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the USFS and BLM for inspection at any time and shall be submitted to the USFS and BLM permit administrators on a monthly basis. 6) During Project operation and maintenance activities, weeds shall be removed in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a USFS/BLM-approved method. 2b **Remove weed seed sources from construction access routes.** Before construction, LADWP shall initiate invasive species eradication along construction access routes to minimize the potential of weeds spreading aggressively during construction. Post-construction, these treatment areas will be included and treated according to the restoration plan. Per the Forest Service Manual (FSM) 2080 Best Management Practice (BMP) guideline, LADWP shall also remove or reduce sources of weed seed along the travel routes associated with Project construction. Weed species identified along the Alternatives and associated access roads include tocalote, artichoke thistle, tree tobacco, saltcedar, slender wild oat/wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, blessed thistle, filaree, shortpod mustard, prickly lettuce, common horehound, yellow sweetclover, rabbit foot grass, Mediterranean grass, sowthistle, rat-tail fescue, tree-of-heaven, giant reed grass, yellow starthistle, bull thistle, fennel, perennial pepperweed, and black locust.. To prevent the introduction or control the spread of invasive weeds, herbicide, hand removal or other control methods will be implemented to reduce seed production during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, LADWP shall identify, using an authorized plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF and BLM lands. Target infestations identified by Project surveys should be controlled before construction. LADWP shall initiate eradication of the target infestations discovered during pre-construction surveys along construction routes. 2c **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Before construction and during each year of construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF and BLM lands, weed-infested areas shall be hand-weeded and/or treated as appropriate for the individual weed species under the guidance of an authorized plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the USFS/BLM. Unless otherwise authorized by the USFS/BLM, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, bromes and other invasive weed seed production, by herbicide application or other control techniques prior to flowering. All plant debris shall be disposed of at a USFS/BLM approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by an authorized plant ecologist or restoration ecologist in coordination with LADWP and USFS/BLM botanist or weed specialist. 2d **Use of Herbicides to Control Exotic Weeds.** LADWP may use herbicides where deemed necessary for the control of invasive weeds within the Project area. Weed control shall be species-specific, and herbicides shall be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for the particular weed species. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. Any herbicide use on NFS lands would be subject to the review and approval of the appropriate USFS personnel and in coordination with LADWP. On BLM lands, herbicide use will be guided by an approved, site-specific Pesticide Use Proposal.
BIO-3	*Incorporate riparian area avoidance and permit measures.* The following actions and all permit conditions detailed within the U.S. Army Corps of Engineers individual or Nationwide 12 permit, CDFG 1602 Streambed Alteration Agreement, and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s).

Mitigation Measure	Description
	3a LADWP shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in RCAs without the authorization of the USFS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1 to August 15) unless otherwise approved by the USFS. LADWP shall prepare and implement a USFS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal or tree trimming), monitoring requirements, and restoration requirements. This Plan shall be submitted to the USFS for approval before construction or the grading of any access road. **3b** Before construction, an authorized biologist shall stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones will include an appropriate buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities shall be restricted from these zones, although essential vehicle operation and foot travel will be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited within the exclusion zone. **3c** In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector and USFS, shall narrow the width of the road through the area to the minimum extent required for safe travel. New spur roads and existing access road improvements shall be constructed and implemented using methodology that preserves existing hydrology. **3d** Towers shall not be constructed in riparian areas. **3e** All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities shall be restored according to the guidelines of the Habitat Restoration Plan to the extent required to ensure no net loss of habitat functions and values. Following construction activities, the areas will be restored as soon as practicable. **3f** Permanent, unavoidable losses of riparian areas will be mitigated by restoration and/or preservation of off-site habitats, as outlined in the Habitat Restoration Plan. The final mitigation and off-site restoration locations will be determined in consultation with LADWP and the relevant permitting agency(s). Mitigation acreage ratios will be consistent with those listed in Table BIO-MM-1.
BIO-4	*Provide restoration/compensation for affected jurisdictional areas.* **4a** Impacts to areas under jurisdiction of the USACE, RWQCB, USFS and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible, including emergency repairs, and access/spur roads within RCAs, the applicant shall provide the necessary mitigation required as part of wetland permitting. This will include creation, restoration, and/or preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation will be determined in consultation with LADWP and the responsible agency(s) as part of the wetland permitting process. **4b** Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas.
BIO-5	*Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.* **5a.** Conduct preconstruction surveys in locations where potential habitat exists for special-status species to avoid impacts during construction. If wildlife sign or habitat is detected during the surveys, construction activities will be monitored by authorized biologists, or exclusion fencing will be placed around work areas. If federally listed species are found within the area of potential effect, the authorized biologist shall notify the construction manager and the USFWS. The construction manager, in consultation with the USFWS and the authorized biologist, will have the authority to halt all activities until appropriate avoidance measures have been completed. If non-federal special-status species are found within the area of potential effect, the USFS, BLM, and CDFG will be notified and, in consultation with these agencies, agreed-upon appropriate actions to address impacts to the species will be implemented. This only applies to species that are not listed under the California Endangered Species Act (CESA) unless authorized by an Incidental Take Permit (ITP) or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR). **5b.** Cover all steep-walled trenches or excavations used during construction to prevent entrapment of wildlife

Mitigation Measure	Description
	(e.g., reptiles and small mammals). If the trenches or excavations cannot be covered, escape ramps shall be placed into the trench or excavated area, or exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife, shall be inspected by the authorized biologists a minimum of three times per day and immediately before backfilling. All excavated areas shall be covered if left overnight. Furthermore, employees and contractors shall look under vehicles and equipment for the presence of wildlife before moving the vehicle or equipment. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is moved out of harm's way by an authorized biologist. Should a dead or injured special-status species be found in a trench or excavation or anywhere in the construction zone or along an access road, the authorized biologist shall contact BLM and/or USFS (for activities on land managed by the agencies) and the Wildlife Agencies within 48 hours of the finding. The authorized biologist shall record the species found, the location of the finding, and the cause of death (if known), and shall submit a photograph and any other pertinent information; this information shall be submitted to the appropriate wildlife agency.
BIO-6	*Implement a Worker Environmental Awareness Program.* An authorized biologist(s) shall conduct a detailed biological Worker Environmental Awareness Program (WEAP) for all Project personnel before any construction or activities within the Project footprint. The WEAP shall include discussions of Project permits and brief summaries of their conditions; discussions of agency involvement, their applicable sensitivity measures, and relevant environmental protection legislation (e.g., the Endangered Species Act, the Migratory Bird Treaty Act); descriptions of special-status species and other sensitive resources that could exist in the Project area, along with their locations, legal status and protections; and a review of all measures to be implemented for avoidance of these sensitive resources. The final list of wildlife species to be included in the WEAP may be reduced at the discretion of the biologist with concurrence from applicable agencies. **6a.** Training materials and briefings shall also include the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS and BLM lands and identification of USFS and BLM sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. Discussion of GPs and BMPs shall include topics such as appropriate work limits, avoiding the spread of non-native plant species, fire safety, wildlife avoidance, trash and debris collection, spill prevention and containment protocol, and appropriate protocol for passage and/or construction near riparian zones. Sightings of sensitive wildlife species or harmful encounters with any wildlife species shall be reported to the authorized biologist immediately for evaluation and, as necessary, reporting to agencies. **6b.** Training materials and a course outline shall be provided to the USFS/BLM for review and approval at least 30 days before the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (e.g., limited operating periods) will be provided to the environmental monitors and construction crews before ground disturbance. **6c.** The training shall be conducted for all crew members present for the start of construction. If new crew members are brought to the Project after this time, they shall take part in the WEAP before beginning construction work; if the authorized biologist is not available at this time, new crew members shall be given a summary handout of the WEAP until the full WEAP can be administered by the authorized biologist, to be conducted no more than one workweek following the crew members' assignment to the Project. All crew members who have completed the WEAP shall submit their names to a list to be updated continuously and furnished to agencies upon request. No construction worker may work in the field for more than five days without participating in the WEAP.

Mitigation Measure	Description
BIO-7	*Impacts to Raptors.* **7a.** If Project construction activities cannot occur completely outside the bird breeding season, then pre-construction surveys for active nests shall be conducted by a qualified biologist within 1,200 feet of the construction zone no more than seven days before the initiation of construction that would occur between February 1 and August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG, BLM, and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the BLM and USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a species-specific buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The buffer (660-foot eagle and one-mile helicopter) may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance, with the approval of the U.S. Fish and Wildlife Service (USFWS), CDFG, BLM or USFS, as appropriate (USFS 2005). On NFS lands, the USFS shall apply the USFS Land Management Plan Standard S18 (Part 3 of the Land Management Plan), which states, "Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging." If for any reason a bird nest must be removed during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. On BLM lands, this will include coordination and written approval by the BLM. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent. **7b.** Before construction, LADWP shall identify all existing raptor nests that would be affected by Project construction. LADWP shall coordinate with the USFWS, CDFG, USFS and BLM for the proposed removal of nests that may present safety issues associated with the construction activities. All nest removals shall occur after the nest is demonstrated to be inactive by a qualified biologist and have been shown to not result in take as defined by the Migratory Bird Treaty Act (MBTA).
BIO-8	*Avoid nesting season and limit disturbance of nesting birds.* LADWP shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, substation sites, access/spur road locations, or any other area subject to ground disturbance. Surveys for birds shall be conducted for all areas from February 1 to August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a 300-foot buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The 300-foot (or 660-foot eagle and one-mile helicopter) buffer may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance with the approval of the USFWS, CDFG, or USFS, as appropriate and in coordination with LADWP. On NFS lands, the USFS shall have the authority to define/redefine such buffers. The biological monitors shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails.

Mitigation Measure	Description
	The biological monitors shall be responsible for documenting the results of the surveys and the ongoing monitoring and will provide a copy of the monitoring reports for impact areas to the respective agencies (e.g., on NFS lands documentation will be provided to the Forest Biologist). If for any reason a bird nest must be removed during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent.
BIO-9	*No mitigation measures required for Impact BIO-9.*
BIO-10	*No mitigation measures required for Impact BIO-10.*
BIO-11	*Reduce avian electrocutions/collisions on transmission lines.* Raptor safety protection will be required on tower/conductor (lines) in appropriate locations. The Project would have minimum clearance between phase conductors or between phase conductors and grounded hardware, as recommended by the Avian Power Line Interactive Committee (APLIC 2006), that are sufficient to protect even the largest birds, such as California condor, and therefore would present little to no risk of bird electrocution. New Project structures shall be designed to implement collision-reducing techniques as described in the latest version of the APLIC guidelines. Devices such as swan wrapping or other similar functioning devices may be required if areas are identified as being a hazard to birds. In addition, per General Practice (GP) 8, an Avian Protection Plan will be developed for this Project that will include avian collision protocols.
BIO-12	*No mitigation measures required for Impact BIO-12.*
BIO-13	*Protect special-status plant species and their habitat.* **13a.** Conduct preconstruction surveys for State and federal Threatened, Endangered, Proposed, Petitioned, Candidate, USFS Sensitive, USFS Watch, BLM Sensitive, and California Native Plant Society (CNPS) listed plants and avoid any occurrences of these plants. LADWP shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in a 250-foot radius around all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by an authorized plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS. The résumé of the proposed biologists will be provided to the USFS and BLM for concurrence before ground disturbance. The completion of these surveys shall be coordinated with the federal land manager. All listed plant species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with USFWS will occur. **13b.** Before site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance, including human trampling, erosion, and dust. The size of the buffer will depend upon the proposed use of the immediately adjacent lands, and include consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS, CDFG, USFS, and BLM and in coordination with LADWP. If impacts to listed plants are determined to be unavoidable, the USFWS shall be consulted for authorization, through the context of a Biological Opinion. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS before impacts are authorized, whichever is appropriate.

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	13c. Impacts to non-listed plant species (i.e., USFS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other USFS or BLM approved methods. For USFS lands, if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of USFS Sensitive plant species, and reseeding/transplanting are not feasible options, LADWP shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).This ratio will apply only to specific acreage inhabited by special-status plant species that are removed during construction, and will supersede ratios listed in Table BIO-MM-1 regardless of habitat type. The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist. **13d.** All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the federal land manager (USFS and BLM) until the success criteria outlined in the Habitat Restoration Plan are met. Where reseeding has occurred, LADWP shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the federal land manager (USFS and BLM).
BIO-14	*Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat.* **14a** All Project activities taking place within suitable habitat for the western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo shall be conducted from November through early March, which is a period outside their breeding seasons (Sedgwick 2000, Sogge 2000, Brown 1993, Kus 2002, Hughes 1999). If these activities cannot be avoided during the breeding season, the following measures shall apply: **14b** If construction activities must occur during the breeding season in areas that have the potential to support listed riparian species, an authorized ornithologist shall conduct protocol surveys of the Project and adjacent areas within 500 feet to determine if this species is present within the area and to determine breeding status. USFWS protocol surveys will be conducted for southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (if no protocols exist, the appropriate land management agency will establish the protocols to be used). In known occupied habitat for listed riparian birds, LADWP shall only conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season. If breeding is confirmed, the USFWS-recommended buffers will be applied and no activities will occur within that buffer. **14c** Protocol or focused surveys, as appropriate, should be conducted within one year of start of construction. However, on NFS lands, annual surveys in suitable habitat may be required during construction. These surveys may be modified through the coordination with the USFWS, CDFG, USFS, LADWP and the BLM based on the condition of habitat, the observation of the species, or avoidance of riparian areas during the breeding season. **14d** If a territory or nest is confirmed, the USFWS and CDFG shall be notified immediately. On NFS or BLM lands, these agencies would be notified immediately. In coordination with the USFWS, CDFG and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A) hourly Leq at the edge of the nest site as determined by an authorized biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the biologist and USFS, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working

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	in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No construction or vehicle traffic shall occur within this buffer during the breeding season for these species. **14e** The nest must be monitored by an authorized biologist during the construction activities. If the monitor determines that Project activities are disturbing or disrupting nesting activities, the monitor shall notify the construction manager, and the construction manager, in consultation with the biological monitor, has the authority to implement measures to reduce the noise and/or disturbance in the vicinity. **14f** Because these species are State-listed as endangered by CESA, LADWP would apply for an ITP if take of any of these species is anticipated during Project construction.
BIO-15	*Protect coastal California gnatcatcher and its habitat.* **15a.** All Project activities taking place within suitable habitat for the coastal California gnatcatcher shall be conducted from September through February, which is a period outside their breeding season. If these activities cannot be avoided during the breeding season, the following measures shall apply: **15b.** LADWP shall conduct protocol surveys for coastal California gnatcatchers in areas supporting coastal sage scrub habitat that may be affected by the Project. In known occupied habitat for the California gnatcatcher, LADWP shall only conduct focused surveys for coastal California gnatcatchers. Survey areas shall include a 500-foot buffer around Project disturbance areas. **15c.** If a territory or nest is confirmed, the USFWS shall be notified immediately; on NFS or BLM lands, these agencies would also be notified immediately. In coordination with the USFWS and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A)hourly Leq at the edge of the nest site as determined by an authorized qualified biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No Project activities may occur in these areas unless otherwise authorized by USFWS. LADWP shall obtain incidental take authorization from the USFWS before further activities. **15d.** Protocol or focused surveys, as appropriate, shall be conducted, at a minimum, within one year of start of construction. These surveys may be modified through the coordination with the USFS, BLM, and CDFG based on the condition of habitat, the observation of the species, or avoidance of nesting areas during the breeding season. **15e.** Construction activities in occupied gnatcatcher habitat will be monitored by a full-time authorized biologist. The monitoring shall be of a sufficient intensity to ensure that the biologist could detect the presence of a bird in the construction area. At a minimum, one full-time monitor shall be present for every two miles of active construction within occupied habitat. The monitors shall notify the construction manager, and the construction manager. in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed.

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BIO-16	*Protect burrowing owl.* The following measures are proposed to minimize the potential for take of burrowing owl nests during construction associated with the proposed Project. **16a** Preconstruction surveys will be conducted throughout the Project site and laydown areas for burrowing owls, possible burrows, and sign of owls (e.g., pellets, feathers, white wash). **16b** Occupied burrows will not be disturbed during the breeding season (February 1 through August 31) unless an approved biologist verifies, through non-invasive methods, that both 1) the birds have not begun egg-laying and incubation, and 2) that juveniles from the occupied burrow are foraging independently and are capable of independent survival. **16c** Occupied burrows will be protected with a 600-foot buffer, if possible. **16d** When the destruction of an occupied burrow is unavoidable, the owl(s) will be passively relocated in accordance with the CDFG memo dated October 17, 1995. Relocation efforts will occur at least one week before ground disturbance of the area. A biologist will monitor the success of the relocation. A monitoring plan will be submitted to and approved by CDFG and BLM.
BIO-17	*Protect the bald eagle and golden eagle.* **17a** If construction occurs during bald eagle and golden eagle breeding season, preconstruction surveys shall be conducted, in accordance with USFWS protocol requirements, for the Project area in regions with suitable habitat. Any active nests shall have an appropriate exclusion buffer established. This buffer shall be established based on existing conditions in consultation with the LADWP, USFS, BLM, CDFG and/or USFWS. **17b** Whenever bald eagles and golden eagles are observed within 100 yards of the construction area, construction shall be halted and shall not resume until the eagles leave. **17c** If a helicopter will be used for construction or maintenance, the aircraft must be no closer than 1,000 feet vertical or horizontal distance from communal roost sites.
BIO-18	*Protect California condor.* **18a** For all Project activities taking place immediately adjacent to or within known condor-occupied areas, a qualified biologist will monitor all construction activities and assist LADWP in the implementation of the monitoring program. The résumé of the proposed biologist(s) will be provided to the BLM and USFS for concurrence. This biologist(s) will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within known condor-occupied areas. The authorized biologist shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area. The authorized biologist will have radio contact with the Project foreman, who will be in radio contact with the helicopter pilot. The biologist will provide information to LADWP to avoid conflicts with condors. All condor sightings in the Project area will be reported to the USFWS and USFS (on NFS lands). LADWP will coordinate with USFWS on the construction schedule and helicopter work areas to determine if any condors have been tracked or observed in the vicinity of the Project area. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area and the USFWS will be notified immediately. Should condors be found roosting within 0.5 mile of the construction area, no construction activity shall occur between one hour before sunset to one hour after sunrise, or until the condors leave the area. Should condors be found nesting within 1.5 miles of the construction area, no construction activity will occur until further authorization from the USFWS and USFS (on NFS lands). **18b** **Microtrash**. All trash is required to be disposed of as written in the Proper Disposal of Construction Waste Plan for the Project. Additional language has been added to this Plan to address the disposal of microtrash. Workers will be trained on the issue of microtrash – what it is, its potential effects to California condors, and how to avoid the deposition of microtrash. In addition, all workers will properly dispose of their trash throughout the day and daily sweeps of the work area will occur to collect and remove trash in locations with the potential for California condors to occur. **18c** **California Condor Worker Education Program**. LADWP will develop a flyer that will be distributed to all workers on the Project concerning information on the California condor. Information to be included consists of the following: species description with photos and/or drawings indicating how to

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	identify the California condor and how to distinguish condors from turkey vultures and golden eagles; protective status and penalties for violation of the Endangered Species Act; avoidance measures being implemented on the Project; and contact information for communicating condor sightings. **18d** **Reporting**. All California condor sightings in the Project area will be reported directly to the USFWS, USFS, and BLM (as appropriate). Before commencement of helicopter activity, LADWP will coordinate with a USFWS condor biologist to determine if any condors have been tracked or observed in the vicinity of the Project area.
BIO-19	*Protect California spotted owl.* Before construction activities within suitable habitat, LADWP shall have a qualified biologist conduct USFS protocol surveys for the California spotted owl to establish or confirm the location of nests within the Project. The résumés of the proposed biologists shall be provided to the USFS for concurrence. If nests or breeding pairs are found during the surveys, the limited operating period (LOP) will be applied according to the ANF Land Management Plan (Standard 20 – Part 3). No Project-related activities will be allowed within these dates (February 1 to August 15) or until chicks have fledged. Where a biological evaluation by a qualified ornithologist determines that a nest site would be shielded from planned activities by topographic or other features that would minimize disturbance, the buffer distance may be reduced upon approval of the USFS on NFS lands. In addition, no helicopter overflights shall be authorized without USFS approval. If approved, minimum altitudes will be 300 feet above a territory at an altitude designated by the USFS. This buffer may be adjusted through consultation with the USFS.
BIO-20	*Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox.* **20a.** In areas identified as suitable habitat during the 2008 surveys, preconstruction surveys will occur for badgers, ground squirrels, pocket mice, and kit foxes. If present and feasible, construction would be avoided in or adjacent to occupied habitat during breeding season. **20b.** LADWP will consult with CDFG to see if a 2081 Permit for incidental take of Mohave Ground Squirrel is required.
BIO-21	*Protect sensitive bat species.* **21a** **LADWP shall conduct a pre-construction survey** (e.g., vegetation removal, grading) for roosting bats within 200 feet of Project activities within 15 days before any grading of rocky outcrops or removal of trees (particularly trees 12 inches in diameter or greater than 4.5 feet above-grade with loose bark or other cavities). 1) LADWP shall also conduct surveys for roosting bats during the maternity season (March 1 to July 31) within 300 feet of Project activities. Trees, rocky outcrops, and mine features shall be surveyed by a qualified bat biologist (i.e., a biologist holding a CDFG collection permit and a Memorandum of Understanding with CDFG allowing the biologist to handle bats). Surveys duration shall be a minimum of one day and one evening. The résumé of the biologist shall be provided to the USFS and BLM (as appropriate) for concurrence before any Project activities. 2) If active maternity roosts or hibernacula are found, the rock outcrop or tree occupied by the roost shall be avoided (i.e., not removed) by the Project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/USFS/BLM approved methods) for nearby alternative maternity colony sites. If the bat biologist determines, in consultation with and with the approval of the CDFG, USFS, and BLM (as appropriate), that there are alternative roost sites used by the maternity colony and young are not present, no further action is required, and it will not be necessary to provide alternative roosting habitat (i.e., Mitigation Measure BIO-21b would not apply, although Mitigation Measure BIO-21c would still apply). However, if there are no alternative roost sites used by the maternity colony, Mitigation Measure BIO-21b is required. If no active roosts are found, no further action is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, Mitigation Measure BIO-21b is not necessary, but Mitigation Measure BIO-21c is required. **21b** **Provision of substitute roosting bat habitat.** If a maternity roost will be impacted by the Project, and no alternative maternity roosts are in use near the site, substitute roosting habitat for the maternity colony shall be provided on, or close to, the Project site no less than three months before the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific

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	bats' requirements in coordination with CDFG and ANF. By making the roosting habitat available before eviction (Mitigation Measure BIO-21c), the colony will have a better chance of finding and using the roost. Large concrete walls (e.g., on bridges) on south or southwestern slopes that are retrofitted with slots and cavities are an example of structures that may provide alternative roosting habitat appropriate for maternity colonies. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The appropriate agencies shall also be notified of any hibernacula or active nurseries within the construction zone. Construction will not proceed in proximity of active hibernacula or nurseries until approved by appropriate agencies. Exclude bats before demolition of roosts. If non-breeding bat hibernacula are found in towers or trees scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted upon the approval of appropriate agencies and under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). The résumé of the bat biologist shall be provided to the CDFG, USFS, and BLM (as appropriate) for concurrence before any Project activities. In situations requiring one-way doors, a minimum of one week shall pass after doors are installed, and temperatures should be sufficiently warm for bats to exit the roost, because bats do not typically leave their roost daily during winter months in southern coastal California. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal). 1) If an active maternity roost is in an area to be impacted by the Project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., before March 1) or after young are flying (i.e., after July 31) using the exclusion techniques described above. **21c** **Survey for bat nursery colonies.** A CDFG-approved biologist shall conduct a habitat assessment for bat nursery colonies before any construction activity. The approved biologist shall then conduct a survey for bat nursery colonies or signs of such colonies before construction. Direct impacts to a nursery colony site shall not be allowed, and approach of, or entrance to, an active nursery colony site shall be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist shall work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active). The methods shall include an option to halt any construction activity that would cause falling rock, substantial vibration impacts, or any other construction-related impact to a nursery colony as determined by the approved biologist, until the colony is inactive. Should falling rock block the entrance to a nursery colony site, the contractor shall work with the approved biologist to reopen an entrance to the site. **21d** If habitat must be removed for construction to continue, a two-step removal process will be implemented. The two-step removal process will involve permitted biologists to alter the habitat outside of the season of use (i.e., outside of hibernating/maternity season) to make the habitat less suitable, and the following day the habitat will be removed under the supervision of the permitted biologist.
BIO-22	*Protect special-status herpetofauna.* An authorized biologist with demonstrated expertise with special-status herpetofauna shall monitor all construction activities and assist LADWP in the implementation of the monitoring efforts. The résumé of the proposed biologist will be provided to the USFS or BLM (as appropriate) for concurrence before the onset of ground-disturbing activities. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of the special-status herpetofauna. Any special-status herpetofauna found within a Project impact area shall be captured by the authorized biologist and relocated to suitable habitat outside the impact area. If the installation of exclusion fencing is deemed necessary by the authorized biologist, the authorized biologist will direct the installation of the fence. Exclusion fencing will only be used for special-status herpetofauna that are not protected by CESA, unless specifically authorized by an ITP, or are not considered Fully Protected Species under Fish and Game Code or Title 14 of the CCR. Clearance surveys for special-status herpetofauna shall be conducted by the

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	authorized biologist before the initiation of construction each day. Authorized non-federal biologists will have the appropriate CDFG scientific collection permit.
BIO-23	*Protect desert tortoise and habitat loss.* **23a** In areas of suitable desert tortoise habitat, preconstruction clearance surveys according to USFWS protocol will be conducted by authorized biologists. Surveys will be conducted by an authorized biologist and will provide 100 percent coverage of all areas to be disturbed during construction. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises will be examined to assess occupancy of each burrow by desert tortoises and processed in accordance with the current USFWS guidelines (USFWS 2009d). If tortoise is observed or sign is found, construction activities will be monitored by a biologist authorized by the USFWS. If no tortoise sign is found, monitoring by an authorized biologist would not be required. Should a tortoise wander into non-monitored construction sites, all ground-disturbing activities will stop and a biologist approved to handle desert tortoise will be called to the site to move the tortoise out of harm's way, and the remainder of construction in desert tortoise habitat shall be monitored by an authorized biologist. **23b** Vehicular traffic during construction in desert tortoise habitat will be confined to existing routes of travel to and from the Project site, and cross-country vehicle and equipment use outside designated work areas will be prohibited. Where new access is required outside of existing roads (e.g., new spur roads) or the construction zone, the route will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction and desert tortoise clearance surveys will be conducted. During the desert tortoise active season (March to May and September to October), speed limits along Project roads shall be limited to 15 mph in desert tortoise habitat. **23c** Burrows within the construction zone or along access routes shall be flagged by the authorized biologist so that the qualified biologist would be able to more easily locate them during construction. The authorized biologist shall be on-site to monitor all construction that occurs in the vicinity of flagged burrows and to ensure that desert tortoise impacts are avoided during Project construction. All desert tortoise burrows or pallets in the construction area shall be excavated by the USFWS-authorized biologist if they cannot be avoided by Project realignment. The construction area includes the expansion area of the Barren Ridge Switching Station (235 feet) and 500 feet total or 250 feet on either side of the new 230 kV transmission line. The 250 feet on either side of the transmission line account for the access roads, spur roads, tower assembly, and installation. The staging sites and concrete batch plants will not be placed within the desert tortoise habitat. **23d** Desert tortoises that are found above ground in active construction areas shall be placed out of harm's way in the shade of a shrub or other cover location by the USFWS and BLM-authorized biologist. Any desert tortoise removed from burrows shall be placed in an unoccupied burrow of approximately the same size as the one from which it was removed. Tortoises shall not be placed more than 1,000 feet from where they were found. If an existing burrow is unavailable, the authorized biologist shall construct or direct the construction of a burrow of similar size, shape, depth, and orientation as the original burrow. Desert tortoises moved during inactive periods would be monitored for at least one week after placement in the new burrows to ensure their safety. of its own accord, activities would be halted until the authorized biologist is able to move it out of harm's way. **23e** Any time a vehicle is parked, the ground around and under the vehicle shall be inspected for desert tortoises before the vehicle is moved. If a desert tortoise is observed, it shall be left to move on its own. If the tortoise does not move within 15 minutes, the authorized biologist shall relocate the tortoise out of harm's way, but no more than 1,000 feet from its original location. Moving desert tortoise from harm's way will only occur on the transmission line portions of the Project. A desert tortoise translocation plan may be needed if desert tortoises are found within the Barren Ridge Switching Station expansion site; the authorized biologist shall contact the USFWS for guidance on developing this plan. **23f** Within potential desert tortoise habitat areas, vehicles shall not exceed 20 miles per hour on access roads during the period of highest desert tortoise activity (March 1 through October 31). **23g** Tower foundations or other excavations that pose a potential to entrap or injure desert tortoise shall be inspected three times daily until the foundation or other structure is in place and the excavation is filled in. Excavations also will include an escape ramp. **23h** The Project Worker Environmental Awareness Program (WEAP) will include information on desert tortoise. The program will be presented to all personnel who will be onsite at any time, including but

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	not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. This program will be presented in English and Spanish, if appropriate, and contain information concerning the biology and distribution of the desert tortoise as it is relevant to the Proposed Action, its legal status and occurrence in the proposed Project area, the definition of "take" and associated penalties, the terms and conditions of this biological opinion, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when tortoises are encountered or in cases of non-compliance with the Biological Opinion. The name of each individual trained will be recorded on a sign-in sheet and will become part of the environmental compliance permanent record. **23i** A litter-control program will be implemented to reduce the attractiveness of the area to opportunistic desert tortoise predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed of properly in predator-proof containers with re-sealing lids. Trash containers will be emptied, and construction waste will be removed daily from the Project area and disposed of in an approved landfill. **23j** LADWP shall report any observations of raven predation on desert tortoises in the Project area to CDFG and USFWS. In construction areas that are heavily used and in potentially occupied desert tortoise habitat, work and staging areas, including the locations of the transmission line under construction, may be fenced with approved temporary desert tortoise exclusion fencing in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. An authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the USFWS, CDFG, and with the BLM when construction areas are within lands administered by the BLM. All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed or conducted by an authorized biologist. The fencing will remain in place for the duration of construction activities at a particular location and will be removed when construction activities are complete. **1)** Temporary fencing should consist of 1-inch mesh or 1-inch horizontal by 2-inch vertical mesh (hardware, cloth or plastic) and be installed flush with the ground and extend at least 18 inches above-ground. Temporary tortoise-proof fencing should not be buried. In areas of high rodent activity where plastic mesh is used, temporary fencing may need more frequent monitoring to ensure no breaches exist. A desert tortoise authorized biologist will inspect the fencing on a biweekly basis to ensure that no holes develop that could allow desert tortoises to enter the work areas. If holes are found, they will be repaired immediately. **2)** If a desert tortoise is found within an area that has been fenced to exclude them, activities will cease until an authorized biologist moves it out of harm's way outside of the fence, no greater than 500 meters away from its original location. At this time, the fencing will be inspected for holes, and any breaches in the fence will be immediately repaired. **23k** No pets or firearms will be permitted in the work area.
BIO-24	*Protect arroyo toad and California red-legged frog.* **24a** **LADWP shall conduct USFWS-approved protocol surveys for arroyo toads and California red-legged frogs at all locations containing suitable habitat near the proposed construction sites** within two years before the start of construction. **24b** If arroyo toads are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no arroyo toads are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) LADWP shall retain an authorized biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and assist LADWP in the implementation of the monitoring program. The résumés of the proposed biologists will be provided to the USFS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad.

Mitigation Measure	Description
	2) All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFS and the authorized biologist. LADWP shall provide information on the general location of construction activities within habitat of the arroyo toad and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, LADWP, USFS, USFWS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on arroyo toads. 3) Any arroyo toads found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in areas that contain suitable habitat. 4) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 5) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 6) LADWP will avoid ground disturbing activities (e.g., grading, stream crossing upgrades, parking) along access roads within a 1.0 mi (1.6 km) buffer of occupied stream habitat for arroyo toads during the activity period for arroyo toads (March through November). This date and buffer may be modified based on the existing temperature regime and habitat conditions, with Angeles National Forest approval. 7) LADWP will limit use of the access roads in areas known to support arroyo toad within a 1.0-mile (1.6 km) buffer to daylight hours only during the activity period for arroyo toads (generally March through November). Use of these roadways during rain events will not occur during the activity period for arroyo toads. Vehicle speeds will be limited to 15 mph (24 kph), and no parking or loitering will occur along the access roads. An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code. 8) No stockpiles of materials will occur in areas occupied by arroyo toads. 9) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain arroyo toads will be reported to the USFS and USFWS within one hour. 10) For each ac/ha of arroyo toad occupied habitat that is permanently impacted on the Angeles National Forest, five ac/ha of arroyo toad occupied habitat will be conserved in the vicinity of the impacted habitat (i.e., impacts will be offset at a habitat ratio as required by the final Biological Opinion).
	24c If California red-legged frogs are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no California red-legged frogs are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) All trash that may attract predators of red-legged frogs will be removed from work sites or completely secured at the end of each work day. 2) Between November 1 and March 31, no work will be authorized within one mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. The one-mile buffer distance may be reduced based on the topography of the site, with the approval of the USFWS and the USFS. 3) If and as required by USFWS, between April 1 and October 31, no work will be authorized within 0.5 mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. 4) If and as required by USFWS, from November 1 thru March 31, overflights will be restricted to a

Mitigation Measure	Description
	minimum altitude of 1,000 feet (305 m) from the stream bottom within 1.0 mile (1.6 km) of a California red-legged frog occupied stream. 5) Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFWS and the USFS-approved biologist (authorized biologist). The authorized biologist shall hold a current red-legged frog permit from USFWS. LADWP shall provide information on the general location of construction activities within habitat of the red-legged frog and the actions taken to reduce impacts to this species. Because red-legged frogs may occur in various locations during different seasons of the year, LADWP, USFWS, USFS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on red-legged frogs. 6) Where construction would occur in habitat where red-legged frogs are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the LADWP and the responsible agency(s). All workers will be advised that equipment and vehicles must remain within the fenced work areas. 7) The authorized biologist will direct the installation of the fence and conduct a minimum of three nocturnal surveys. If red-legged frogs are observed on the final survey or during subsequent checks, the authorized biologist shall halt construction and report to the USFWS and the USFS immediately. 8) Fencing to exclude red-legged frogs will be at least 24 inches in height. 9) Construction activities that may occur near breeding pools or other areas where large numbers of red-legged frogs may congregate will be conducted during times of the year when individuals have dispersed from these areas (i.e., winter) or the species is dormant, unless otherwise authorized by the USFS and USFWS. The authorized biologist will assist LADWP in scheduling its work activities accordingly. 10) Any red-legged frogs found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in the work area. 11) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 12) LADWP shall avoid nighttime activities when red-legged frogs may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area. 13) An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible, and ensure that activities are in compliance with the California Fish and Game Code. 14) No stockpiles of materials will occur in areas occupied by California red-legged frogs. 15) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 16) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain California red-legged frogs will be reported to the USFS and the USFWS within one hour.

2.4 EXISTING ENVIRONMENT

The physiography of the Project area in the Los Angeles and Kern County regions from north to south is the flat Antelope Valley gradually rising in elevation (Northern region) and giving way to the foothills of the ANF (Central region). Continuing south, the foothills gradually give way to the City of Santa Clarita (Southern region). Drainages originating from the foothills of the ANF have carried rock detritus and water to the Santa Clarita area. This has produced several riparian areas, which support a rich, varied, and unique ecosystem. The diversity and distribution of biological resources within the study corridor are a function of the regional climate, soils, and topography. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species. To provide baseline conditions for the dominant soil type, water and habitat characteristics the biological study was divided to three ecotype regions (Northern, Central and Southern). The Northern and Southern regions of the Project do not occur within the ANF at all and are not discussed further. The Central region of the BRRTP encompasses the southern ends of Alternatives 1, 2, 2a, and 3, as well as Segment J (new 230 kV circuit between Haskell Canyon and the Castaic Power Plant), and is discussed below in greater detail.

2.5 CENTRAL REGION – ANF BOUNDARIES

Alternatives 1, 2, 2a, 3, the new 230 kV circuit (Segment J), and reconductoring component within the ANF are located in steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands (Table 3). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

TABLE 3. SOIL TYPES PRESENT IN CENTRAL REGION

Segment	Soil Series	Drainage Class	Series Soil pH
Alternative 1	Cortina	Excessively drained	Slightly acid
Alternative 1	Hanford	Well drained	Slightly alkaline
Alternative 1	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 1	Millsholm	Well drained	Neutral to slightly acid
Alternative 1	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 1	Osito family	Well drained	Neutral to slightly acid
Alternative 1	Rock outcrop	N/A	Neutral
Alternative 1	Saugus	Well drained	Slightly acid
Alternative 1	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Amargosa	Excessively drained	Neutral
Alternative 2/ Reconductor	Chino	Excessively drained	Moderately alkaline
Alternative 2/ Reconductor	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Greenfield	Well drained	Neutral
Alternative 2/ Reconductor	Hanford	Well drained	Slightly acid
Alternative 2/ Reconductor	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Millsholm	Well drained	Slightly acid
Alternative 2/ Reconductor	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 2/ Reconductor	Ramona	Well drained	Moderately acid
Alternative 2/ Reconductor	Rock outcrop	N/A	Neutral
Alternative 2/ Reconductor	San Andreas family	Well drained	Moderately acid
Alternative 2/ Reconductor	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Tujunga family	Excessively drained	Slightly acid
Alternative 2/ Reconductor	Vista	Well drained	Neutral
Alternative 2/ Reconductor	Yolo	Well drained	Neutral
Alternative 2a	Amargosa	Excessively drained	Neutral
Alternative 2a	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2a	San Andreas family	Well drained	Moderately acid
Alternative 2a	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 3	Amargosa	Excessively drained	Neutral
Alternative 3	Anaverde	Well drained	Neutral

Segment	Soil Series	Drainage Class	Series Soil pH
Alternative 3	Castaic	Well drained	Slightly acid
Alternative 3	Cortina	Excessively drained	Slightly acid
Alternative 3	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 3	Godde	Well drained	Slightly acid
Alternative 3	Greenfield	Well drained	Neutral
Alternative 3	Hanford	Well drained	Slightly acid
Alternative 3	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 3	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 3	Mocho	Well drained	Moderately alkaline
Alternative 3	Saugus	Well drained	Neutral to slightly acid
Alternative 3	Vista	Well drained	Neutral
Alternative 3	Wyman	Well drained	Neutral
Alternative 3	Yolo	Well drained	Neutral
New 230 kV Circuit	Castaic	Well drained	Slightly acid
New 230 kV Circuit	Hanford	Well drained	Slightly acid
New 230 kV Circuit	Metz	Somewhat excessively drained	Moderately alkaline
New 230 kV Circuit	Millsholm	Well drained	Slightly acid
New 230 kV Circuit	Mollic Haploxeralfs	Well drained	Extremely acid
New 230 kV Circuit	Rock outcrop	N/A	Neutral
New 230 kV Circuit	Saugus	Well drained	Neutral to slightly acid
New 230 kV Circuit	Zamora	Well drained	Neutral

Within the central eco-region boundary, the vegetation composition is predominantly shrubs, approximately 137,000 acres. The eco-region is dominated by mixed chaparral series with a sparse mixture of deciduous and pine forests, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin. Predominant plant species include *Quercus* spp. (Oak species), *Ceanothus* spp. (Sugar Brush), *Arctostaphylos glauca* (Big Berry Manzanita), *Adenostoma fasciculatum* (Chamise) and *Eriogonum fasciculatum* (California buckwheat). There are three major drainages and several small drainages that originate from the foothills of the Angeles National Forest and spread over the northwestern Los Angeles County region. The San Francisquito Canyon Creek, a minor drainage in the area, has several small distributaries. A second drainage, originating from Bouquet Reservoir, is Bouquet Canyon Creek. The third drainage, Santa Clara River, has several small distributaries, including Mint Canyon Creek, Rowher Canyon Creek, and Aqua Dulce Canyon Creek. The Santa Clara River also has two minor distributaries, San Francisquito Canyon Creek and Bouquet Canyon Creek. Many reaches of these natural and modified stream channels have the ability to support riparian areas and function as wildlife corridors.

Wildfires are an integral part in the biodiversity of plant and animals ecosystems in Southern California (Zedler 1995). Within the last fifty years, there have been nine fires that have burned over 10,000 acres within the Project area. One of the more recent large wildfires was the 2007 Buckweed Fire, which burned approximately 40,000 acres east of Santa Clarita and to the north of State Route 14 and burned through a significant portion of Alternatives 2 and 2a. The vegetation in this burned portion of Alternative 2 is varying in its regrowth response from a range of poor to moderate. The lack of highly successful regrowth can be attributed to the prevalence of invasive, non-native plants, which are outcompeting the native species.

2.5.1 Vegetation Communities

The Project area within the ANF was surveyed during the spring and summer months in 2008, 2009, and 2010. Botanical surveys were conducted and current vegetation communities were mapped and the data used to refine existing Project vegetation maps that were based off of Gap Analysis Program (GAP) data.

Vegetation communities that are present within the forested Project area and their respective acreages and disturbance estimates include the following:

TABLE 4. ESTIMATED TEMPORARY DISTURBANCE OF VEGETATION COMMUNITIES WITHIN THE BRRTP

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Alternative 1							
Chamise Chaparral	Forest Service	488.38	50.87	56.06	9.98	16.73	3.43%
Riversidian Sage Scrub	Forest Service	100.74	9.74	10.48	1.84	3.06	3.04%
Southern Coast Live Oak Riparian Forest	Forest Service	3.59	0.38	0.38	0.05	0.05	1.35%
Southern Cottonwood Willow Riparian Forest	Forest Service	8.04	0.86	0.86	0.23	0.42	5.28%
Southern Mixed Chaparral	Forest Service	349.92	40.80	45.81	8.36	14.13	4.04%
Southern Sycamore Alder Riparian Woodland	Forest Service	2.38	0.25	0.25	0.07	0.13	5.28%
Southern Willow Scrub	Forest Service	12.91	1.11	1.30	0.19	0.32	2.48%
Alternative 2 – LADWP's Proposed Action and Federal Agency Preferred Alternative							
Chamise Chaparral	Forest Service	344.45	38.61	39.38	6.9	10.11	2.9%
Barren/developed	Forest Service	231.75	24.86	24.86	4.84	7.80	3.4%
Riversidian Sage Scrub	Forest Service	82.47	8.85	8.85	1.37	1.84	2.2%
Southern Coast Live Oak Riparian Forest	Forest Service	20.33	3.01	3.40	0.56	0.69	3.4%
Southern Mixed Chaparral	Forest Service	81.79	8.77	8.77	1.89	3.24	4.0%
Southern Riparian Scrub	Forest Service	6.19	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	Forest Service	20.32	2.18	2.18	0.50	0.50	2.5%
Alternative 2a							
Canyon Live Oak Forest*	-	-	-	-	-	-	-
Chamise Chaparral	Forest Service	344.44	38.61	39.38	6.90	10.11	2.94%
Disturbed/developed	Forest Service	119.26	12.45	12.72	2.15	3.24	2.72%
Interior Live Oak Chaparral	Forest Service	53.92	5.18	5.60	1.14	2.06	3.83%
Riversidian Sage Scrub	Forest Service	82.47	8.85	8.85	1.37	1.84	2.23%
Scrub Oak Chaparral	Forest Service	30.05	3.12	3.19	0.78	1.46	4.85%
Southern Coast Live Oak Riparian Forest	Forest Service	20.33	3.01	3.40	0.56	0.69	3.39%
Southern Mixed Chaparral	Forest Service	268.16	25.39	27.88	5.17	9.03	3.37%
Southern Riparian Scrub	Forest Service	6.19	0.66	0.66	0.17	0.33	5.28%
Southern Sycamore Alder Riparian Woodland	Forest Service	15.32	1.64	1.64	0.43	0.81	5.27%
Alternative 3							
Barren/developed	Forest Service	19.45	2.12	2.13	0.56	1.04	5.35%
Riversidian Sage Scrub	Forest Service	140.94	24.72	28.19	5.81	9.57	6.79%
Scrub Oak Chaparral	Forest Service	54.36	5.83	5.83	1.52	2.87	5.28%
Southern Riparian Scrub	Forest Service	6.47	0.69	0.69	0.18	0.34	5.28%
Reconductoring							
Chamise Chaparral	Forest Service	304.26	32.65	32.65	8.54	16.07	5.3%
Disturbed/developed	Forest Service	235.69	25.28	25.28	4.86	7.77	3.3%
Riversidian Sage Scrub	Forest Service	85.68	10.30	10.30	2.69	5.07	5.9%
Southern Coast Live Oak Riparian Forest	Forest Service	61.53	6.60	6.60	1.73	3.25	5.3%

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Southern Mixed Chaparral	Forest Service	74.74	8.01	8.01	1.69	2.87	3.8%
Southern Riparian Scrub	Forest Service	6.17	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	Forest Service	19.61	2.34	2.34	0.54	0.95	4.8%
New 230 kV Circuit							
Chamise Chaparral	Forest Service	139.37	21.06	23.05	4.73	8.03	5.8%
Riversidian Sage Scrub	Forest Service	55.49	5.96	5.96	1.20	1.98	3.6%
Southern Coast Live Oak Riparian Forest	Forest Service	6.11	0.66	0.66	0.08	0.08	1.3%
Southern Cottonwood Willow Riparian Forest	Forest Service	7.49	0.80	0.80	0.21	0.40	5.3%
Southern Sycamore Alder Riparian Woodland	Forest Service	1.78	0.19	0.19	0.05	0.09	5.1%

*Note: Although Canyon Live Oak Forest was identified as a vegetation community present on Alternative 2a during 2010 BRRTP botanical surveys, it is not one of the communities listed in the GAP data for this area (POWER 2010b). Because vegetation community mapping was not conducted during the botanical surveys, the exact area and corresponding impact acreages for Canyon Live Oak Forest were not calculated. Acreage numbers for other habitat types listed on Alternative 2a thus may be smaller than those listed in the table above, which is based only on GAP data. This will not change the total acreage of Alternative 2a.

Coast Live Oak Woodland

As described by Holland (1986), coast live oak woodland is composed of semi-open stands dominated by evergreen trees of coast live oak (*Quercus agrifolia*). This type is widely distributed in coastal valleys and low hills of California. In southern California it is often restricted to north-facing slopes and shaded ravines (Holland 1986). The equivalent series in Sawyer and Keeler-Wolf (1995) is the coast live oak series.

Where this community is located within the Project area on ANF lands, coast live oak is the dominant tree, with an understory that includes holly-leaved redberry, chaparral nightshade, common bedstraw (*Galium aparine*), and California blackberry (*Rubus ursinus*). Associated species include durango root *(Datisca glomerata),* common hareleaf *(Lagophylla ramosissima* ssp. *ramosissima),* giant wild-rye *(Leymus condensatus),* common horehound *(Marrubium vulgare),* California burclover (*Medicago polymorpha),* branching phacelia (*Phacelia ramosissima* var. *latifolia),* and blue elderberry.

Coast live oak woodland is present on Segment G around Drinkwater Flat and Bee Canyon, and on the Green Valley Localized Re-Route (Segment 2a).

Riparian Willow Scrub

Riparian willow scrub is similar to Holland's southern willow scrub (Holland 1986), but differs from it because it is not a coastal type and does not occur along major rivers. The type referred to here as riparian willow scrub is a shrub-willow-dominated vegetation type; this vegetation is denser, and is found at higher elevations than alluvial wash scrub.

The predominant species are narrow-leaved willow (*Salix exigua*), red willow *(Salix laevigata*), and arroyo willow *(Salix lasiolepis).* There are a few scattered trees of western sycamore *(Platanus racemosa*) and coast live oak. Other shrub species include mulefat (*Baccharis salicifolia*), basketbush, California wild rose *(Rosa californica),* and poison oak. The herbaceous layer in this community includes emergent wetland species, such as Dudley's sedge (*Carex dudleyi),* Parish's spike-rush *(Eleocharis parishii),* toad-rush *(Juncus bufonius),* western rush *(Juncus occidentalis),* broadleaf cattail *(Typha latifolia*) white water-cress *(Rorippa nasturtium-aquaticum*) and water speedwell *(Veronica anagallis-aquatica).* Native perennial upland species include narrow-leaved California fuchsia (*Epilobium canum* ssp. *canum*), beardless wild-rye *(Elymus triticoides)* and giant wild-rye. This type may correspond to the mixed willow series of Sawyer and Keeler-Wolf (1995).

Riparian willow scrub was found along intermittent drainages within a section of Segment G.

Southern Sycamore-Alder Riparian Woodland

The Holland type southern sycamore-alder riparian woodland is a tall, open, broad-leaved, winter-deciduous streamside woodland (Holland 1986). Western sycamore, bigleaf maple (*Acer macrophyllum*), and white alder (*Alnus rhombifolia*) form the semi-open tree canopy. It is characteristic of drainages with seasonal high intensity flows in the Transverse and Peninsular ranges.

Within ANF land in the Project area, this type was found on a variety of substrates, including sandy alluvium. Variation in tree and shrub density and diversity occurs from site to site. In addition to western sycamore, big leaf maple, and white alder as dominant trees, this type includes as tree associates coast live oak and canyon live oak (*Quercus chrysolepis*). Dominant shrubs include Tucker's oak (*Quercus john-tuckeri*), arroyo willow, California sagebrush, mulefat, bush mallow (*Malacothamnus fremontii*), and California buckwheat. The diverse understory of herbaceous plants includes clarkia, seep monkey-flower (*Mimulus guttatus*), annual Indian paintbrush (*Castilleja minor*), chaparral honeysuckle (*Lonicera interrupta*), Hooker's evening primrose (*Oenothera elata*), tomcat clover (*Trifolium willdenovii*), California four o'clock (*Mirabilis californica*), sturdy sedge (*Carex alma*), toad-rush and sticky chickweed (*Cerastium glomeratum*). Invasive non-native plants common in this type include tamarisk *(Tamarix ramosissima*), tree tobacco *(Nicotiana glauca*) and rabbitsfoot grass (*Polypogon monspeliensis*).

Southern sycamore-alder riparian woodland was observed within Segment 2a.

Chamise Chaparral

Chamise chaparral is a Holland type of chaparral usually dominated by a nearly continuous canopy of chamise (Holland 1986). Many other shrub species can grow with chamise in this type, but they make up a small fraction of the total shrub cover. This fire-adapted vegetation type is found on steep, dry, rocky slopes, with shallow soils. It burns frequently, and after fire chamise shrubs and other shrubs in this type rapidly sprout back from the base. Mature chamise chaparral has few plants in the understory; however, after fire a dense understory layer of forbs and grasses may be present. Chamise chaparral is widespread in California; it is more abundant in southern California (Holland 1986). The corresponding series in Sawyer and Keeler-Wolf (1995) is the chamise series.

Chamise chaparral was observed throughout the Project area within the ANF. Much of the surveyed area was burned in large wildfires in 2007 and during the last five years, so chamise and other shrubs were in an early stage of regrowth, and understory forbs and grasses were abundant and diverse at the time of the protocol-level surveys. Associated shrub species include toyon (*Heteromeles arbutifolia*), holly-leaved cherry *(Prunus ilicifolia* ssp. *ilicifolia*), yerba santa, California buckwheat, deerweed, scrub oak (*Quercus berberidifolia*), holly-leaved redberry, white sage, black sage, poison oak (*Toxicodendron diversilobum*), and chaparral yucca. This shrub diversity indicates that, within the Project area, chamise chaparral intergrades with Riversidian sage scrub.

The forb and grass layer is typically very sparse, but after recent fires this layer was well-developed within burned areas. The special-status plant slender mariposa lily (*Calochortus clavatus* var. *gracilis*) was common in recently burned chamise chaparral at the time of the 2008 protocol-level surveys. Other common forbs and grasses included blazing star (*Mentzelia albicaulis*), wild oat, Pacific fescue (*Vulpia microstachys*), six-weeks fescue (*Vulpia octoflora*), shortpod mustard, ripgut brome, red brome, sun cups (*Camissonia* sp.), popcorn flower, red-stemmed filaree (*Erodium cicutarium*), valley lessingia (*Lessingia* *glandulifera*), spear-leaved agoseris, lupines (*Lupinus* spp.), phacelia (*Phacelia* spp.), and fescue (*Vulpia* spp.).

Chamise chaparral was mapped along the southern third of Alternative 2. It was also found along most of the southern half of Segment J.

Barren/Developed

Barren/developed areas are generally subject to intensive use with much of the land covered by structures. Disturbed areas are typically characterized by heavily compacted or frequently disturbed soils, and are often devoid of vegetation or possess only a sparse cover, including ruderal communities which are well adapted to survive in such conditions.

Barren/developed areas were mapped around Green Valley in Alternatives 2 and 2a.

Riversidian Sage Scrub

Riversidian sage scrub is the most xeric form of coastal sage scrub (Holland 1986). This Holland type consists of open stands of shrubs on dry sites such as steep slopes, severely drained soils, or dense clay soils. It intergrades with several types of southern California chaparral. The understory includes grasses and forbs. As described by Holland (1986), the dominant shrubs include California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). This type is distributed along the western base of the Transverse and Peninsular Ranges from Los Angeles County to the Mexican border (Holland 1986).

Riversidian sage scrub consists of fairly open stands of low shrubs and subshrubs. Dominant species include California sagebrush, California buckwheat, brittlebush (*Encelia californica*), yerba santa (*Eriodictyon crassifolium*), sawtoothed goldenbush (*Hazardia squarrosa*), deerweed (*Lotus scoparius*), bush monkeyflower (*Mimulus aurantiacus*), white sage (*Salvia apiana*), and black sage (*Salvia mellifera*). Chamise (*Adenostoma fasciculatum*), holly-leaved redberry (*Rhamnus ilicifolia*), blue elderberry (*Sambucus mexicana*), and chaparral yucca (*Yucca whipplei*) also were present as associates. The forb and grass layer of Riversidian sage scrub is dominated by native and introduced annuals and perennials including common fiddleneck, wild oat (*Avena fatua*), shortpod mustard (*Hirschfeldia incana*), ripgut brome, red brome, miner's lettuce, popcorn flower (*Plagiobothrys* sp.), Parry's larkspur, blue dicks (*Dichelostemma capitatum*), golden yarrow (*Eriophyllum confertiflorum*), vinegar weed (*Trichostema lanceolatum*), slender sunflower (*Helianthus gracilentus*), phacelia (*Phacelia* sp.), chia (*Salvia columbariae*), and fescue (*Vulpia* sp.).

Buckwheat scrub is a subtype of Riversidian sage scrub also observed within Alternative 2. It may correspond to the California buckwheat series of Sawyer and Keeler-Wolf (1995). Buckwheat scrub is dominated by California buckwheat and deerweed. Associated shrub species include chamise, woolly blue-curls (*Trichostema lanatum*), California sagebrush, and black sage. Dominant annual grasses and forbs include fascicled tarweed (*Deinandra fasciculata*), cryptantha (*Cryptantha* sp.), wild oat, and red brome.

Riversidian sage scrub was mapped on the very southern end of Alternative 2. It was also found around the proposed Haskell Canyon Switching Station site, and in patches within the northern half of Segment K.

Interior Live Oak Chaparral

Interior live oak chaparral is a Holland type (Holland 1986) of chaparral dominated by dense, tall shrubs of interior live oak (*Quercus wislizenii* var. *frutescens*) and California scrub oak (*Quercus dumosa*). Holland (1986) describes this as a mesic form of chaparral that interdigitates with chamise chaparral, especially at higher elevations. It is widespread in the interior mountains of California, with a patchy distribution in southern California.

Interior live oak chaparral is dominated by interior live oak and California scrub oak. Associated shrubs include California buckwheat, hoaryleaf ceanothus (*Ceanothus crassifolius*), canyon gooseberry (*Ribes menziesii*), hoary coffeeberry (*Rhamnus tomentella*), and poison oak.

Interior live oak chaparral was observed within Segment 2a.

Scrub Oak Chaparral

The Holland type Scrub oak chaparral is a dense evergreen chaparral dominated by scrub oak (Holland 1986) that reaches 20 feet in height. It grows on rocky slopes, at slightly higher elevations, and in more mesic sites, than other types of chaparral. It is widespread in the coastal areas of northern California, the Sierra foothills and the mountains of southern California.

The species of scrub oak observed in most sites appeared to be California scrub oak; however, scrub oak also occurs within this area. Other shrub species present include deerbrush (*Ceanothus integerrimus*), California juniper (*Juniperus californica*), birchleaf mountain mahogany, holly-leaved cherry, and chaparral yucca.

Scrub oak chaparral was observed within patches throughout Segment I.

Southern Mixed Chaparral

Southern mixed chaparral is described by Holland (1986) as a type composed of deep-rooted sclerophyllous fire-adapted shrubs reaching 6 to 12 feet in height. There is a very sparse understory in mature stands. The dominant shrubs vary from place to place, but include chamise, California scrub oak and one or more species of *Arctostaphylos* and *Ceanothus* (Holland 1986). This type is found on dry, rocky, steep slopes with little soil. It intergrades with chamise chaparral and may form a mosaic with Riversidian sage scrub. Corresponding series in Sawyer and Keeler-Wolf (1995) may include the chamise-bigberry manzanita series and the chamise-Eastwood's manzanita series.

Within the Project area, the dominant shrubs in southern mixed chaparral include chamise, Eastwood's manzanita (*Arctostaphylos glandulosa*), big-berry manzanita (*Arctostaphylos glauca),* California sagebrush, hoaryleaf ceanothus, and birchleaf mountain mahogany (*Cercocarpus betuloides*); associated species included interior goldenbush (*Ericameria linearifolia*), yerba santa, California buckwheat, scale-broom (*Lepidospartum squamatum*), deerweed, holly-leaved cherry, scrub oak, interior live oak, hoary coffeeberry, holly-leaved redberry, sugar bush (*Rhus ovata*), basketbush (*Rhus trilobata*), white sage, black sage, poison oak, and chaparral yucca.

The forb and grass layer includes wild oat, shortpod mustard, ripgut brome, red brome, sun cups, clarkia (*Clarkia* sp.), miner's lettuce, stiff-branch bird's beak (*Cordylanthus rigidus*), popcorn flower, Parry's larkspur (*Delphinium parryi*), slender buckwheat (*Eriogonum elongatum var. elongatum*), golden yarrow, cudweed (*Gnaphalium* sp.), vinegar weed, strigose bird's-foot-trefoil (*Lotus strigosus*), bajada lupine, showy penstemon (*Penstemon spectabilis*), phacelia, chia, chaparral nightshade (*Solanum xanti*), and fescue.

Southern mixed chaparral was mapped along much of the middle third of Alternative 2.

2.6 INVENTORY METHODS

The evaluation of biological resources within the ANF portion of the Project area included a review of applicable documents and the identification of resources during several aerial, reconnaissance-level surveys and focused surveys conducted by qualified biologists. During the development of alternative corridors for the proposed Project, reconnaissance surveys were conducted on every segment. The surveys consisted of a reconnaissance-level survey conducted aerially from a helicopter or from the ground within a 0.5 mile wide corridor buffer of the proposed transmission line corridor where access was available.

Vegetation community mapping was conducted using the California GAP-Analysis Program (GAP), 2005 aerial imaging from the National Agriculture Inventory Program (NAIP) California spatial library, and California Natural Diversity Database (CNDDB) data. Forest Service geographic information system (GIS) habitat data were used as the basis for the habitat-based assessment of the Project study corridors. GIS data layers were mapped within the study corridors (one mile wide biology study corridor) and plotted. The vegetation mapping was conducted using the GAP data but later refined based on field reconnaissance surveys. Information gathered from the literature review and reconnaissance-level field surveys were used to identify habitat for all threatened and endangered plant and wildlife species with potential to occur within the Project area. Protocol surveys were conducted in the spring and summer of 2008, 2009 and 2010 on all Project components to assess the presence of special-status plant and wildlife species (POWER 2008a, POWER 2008b, POWER 2009a, POWER 2009b, POWER 2009c, POWER 2010b, POWER 2010c, POWER 2010d, POWER 2010e, POWER 2010f, POWER 2010g). The details and methods used in this evaluation are presented below.

2.6.1 Protocol Surveys

Information gathered from the literature review and reconnaissance-level field surveys were used to identify habitat for all threatened and endangered, Forest Service Sensitive and Watch plant and wildlife species with potential to occur within the Project area. Protocol surveys were conducted in the spring and summer of 2008, 2009 and 2010 on all project components not covered in dense chaparral, at a distance of 250 feet either side of the proposed centerline and along existing access roads, to assess the presence of special-status plant and wildlife species (POWER 2008a, POWER 2008b, POWER 2009a, POWER 2009b, POWER 2009c, POWER 2010b, POWER 2010c, POWER 2010d, POWER 2010e, POWER 2010f, POWER 2010g).

The study corridors for the surveys were 150-meters (500 feet) wide (250 feet on each side of the transmission line centerline). Prior to conducting field surveys within the ANF, Forest Service and USFWS were consulted to determine survey needs and appropriate survey time frames. Protocol surveys were conducted for the arroyo toad and California red-legged frog, federal- and State-listed plant species, Forest Service Sensitive/Watch plant species, and CNPS List 1 and 2 species. Surveys were also conducted to determine presence of and suitable habitat for California spotted owl, special-status bat species, and special-status riparian bird species. Additionally, invasive weed surveys and an avian risk assessment were conducted (POWER 2009d, POWER 2010h).

Special-Status Plant Surveys

Botanical surveys were conducted in 2008, 2009 and 2010 with the goal of locating and mapping special-status plants. The surveys were floristic, meaning that all plants observed were identified to the taxonomic level needed to determine whether they were special-status plant species. Exceptions to this included instances where characteristics essential for identification were not present during the field survey period. Botanists identified all plant species detected during field surveys using personal knowledge of the plants and keys in *The Jepson Manual* (Hickman 1993). Scientific nomenclature in this report mainly follows Hickman (1993). Common names are derived from Hickman (1993) and CalFlora (2011). The survey methodology generally followed the USFWS' *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996a), and the recommended botanical survey guidelines of the California Department of Fish and Game (CDFG 2000) and the California Native Plant Society (CNPS 2011). Areas with dense, impenetrable chaparral and areas with very steep slopes that posed a safety hazard to surveyors were not surveyed. Within the surveyed segments, botanists used an intuitive approach to determine the route taken during meandering transects. The intuitive-controlled approach, recommended by Forest Service Botanist Katie VinZant, uses the botanist's knowledge of the preferred habitat of special-status plants to focus the survey effort on sites with any chance of supporting them. For this Project, this meant that all open areas within or adjacent to dense chaparral were surveyed. Botanists recorded species observations with Trimble GEO-XT hand-held Global Positioning System (GPS) units using Terrasync software. These units were pre-loaded with maps of the proposed transmission line corridors, buffers, and U.S. Geological Survey (USGS) topographic maps as background files. GPS units were used for navigation, and to collect locational data (points and polygons) when special-status plant species were found.

Spotted Owl Focused Surveys

The California spotted owl survey followed the revised Forest Service methodology outlined in the 1993 Protocol for Surveying for Spotted Owls in Proposed Management Activities Areas and Habitat Conservation Areas (USFS 1993). The protocol prescribes surveys be conducted from March 1 to August 31 and that a total of six surveys be conducted per survey area, either by conducting all six surveys in one year or conducting three surveys per year over a two-year period.

Surveys were conducted from 2008 to 2010 between sunset and sunrise to maximize the potential for detection. These surveys were conducted using the spot calling method, where calling stations were established every 0.25 to 0.5-mile along potential habitat identified during the 2008 habitat assessment. Call stations were grouped into survey routes by proximity and Project segment. Each survey route was surveyed in a single survey outing. Call stations were placed at "outstanding" physiographic features such as prominent ridge points, saddles, and openings in the vegetation to ensure complete coverage of the survey area (USFS 1993). To ensure each survey was conducted at the same locations during each survey, a flag was placed at each call station and a GPS point was taken using a Garmin GPS unit. Each call station was surveyed for at least ten minutes per visit. The order in which each call station was surveyed was varied to reduce bias.

A total of 41 call stations were established along Segment G, at San Francisquito Canyon, Baird Canyon, Clearwater Canyon, Pettinger Canyon, Drinkwater Canyon, Spunky Canyon, South Portal Canyon, Craig Spring, and Grass Mountain. Because no potential habitat was identified during the habitat assessment, no call stations were established for Segment I. A total of three call stations were established along segment J at Dry Canyon. A total of nine call stations were established on Segment D at Fisher Spring, Oak Flat Spring, and Liebre Gulch.

Bat Surveys

Surveys were conducted for bat habitat and species within the BRRTP area during August 2008. Diurnal surveys were conducted to identify suitable roosting and foraging habitat in or near Project segments, while dusk surveys were conducted to observe bat activity at locations determined based on diurnal surveys. Dusk surveys only occurred within the ANF on Segments G and I. Acoustical monitoring of echolocation search and feeding calls were made with a Pettersson D240X Ultrasonic Detector; results were recorded on data sheets measured at fifteen-minute intervals. No invasive techniques were employed during surveys, and all surveys were limited to habitat inspections and visual and acoustical observations of active bats.

Avian Habitat Assessment

Surveys were conducted on ANF in June and August 2008 to evaluate suitable habitat for special-status bird species, including southwestern willow flycatcher, least Bell's vireo, western yellow-billed cuckoo, and coastal California gnatcatcher. Pre-field work included reviewing aerial photographs of the ANF and searching for existing recorded occurrences. Surveys occurred on Segments D, G, I, and J within 500-foot corridors. Potential habitat was defined as habitat that can support both breeding and foraging needs of the species. Both pedestrian and vehicular surveys were conducted as situations dictated. Particular attention was given to areas with previous records of special-status bird species and to riparian and coastal sage scrub habitats. Habitat was recorded with datasheets, photos, and GPS points that were subsequently incorporated into a GIS database.

Invasive Weed Species Surveys

Invasive species surveys were conducted concurrently with the protocol-level special status plant surveys. Locations were recorded using Trimble GEO-XT hand-held GPS units using TerraSync software. Species were mapped as either points or polygons depending on the size of the population.

Within the ANF, mapping included areas adjacent to corridor access roads. In some instances, the ANF botanist had previously mapped or noted invasive species along the access roads. This information is included in the survey report (POWER 2009d).

Avian Risk Assessment

An avian risk assessment was conducted following guidelines provided by the Avian Power Line Interaction Committee (APLIC). The risk assessment determined areas of greatest risk to birds and measures to avoid and mitigate avian risk. Areas identified as potential risks were evaluated in the field and documented using a GPS unit. This information was mapped and provided to the engineering design team to prioritize tower locations. In addition, power line design and avian safety education was provided to the design team.

Before conducting the avian risk assessment surveys, pre-survey research was conducted to determine avian species that have the potential to occur within the Project area. This list of potentially occurring species was compiled using the species lists from local chapters of the Audubon Society in Kern and Los Angeles Counties (Blue and Moore 1998), Edwards Air Force Base (Department of Defense undated), and the Angeles National Forest (Garrett and Alcala 2008). The list included year-round residents, migratory species breeding or wintering in the area, and transitory migrants with a more vagrant occurrence in the Project area (POWER 2010h). Existing LADWP survey information was also used to document locations where avian nesting or presence had been previously observed (LSA 2007). For each potentially occurring species, information was compiled on the distribution, habitat preference, and any known sighting(s). In addition, seasonal wind patterns (Fisk 2007) and topographic data were overlaid to identify potential flyways in the entire Project area.

Surveys occurred during the spring and fall of 2008 (June 9 to 13 and September 22 to 26). Spring surveys were conducted to characterize habitat and document species occurrence and nesting activity across the entire Project area. Datapoints were taken approximately every mile, or at smaller intervals when notable changes were observed (i.e., topography, vegetation community, bird and/or nest presence). After assessing spring survey data and additional data, such as typical wind currents throughout the project area, areas of higher risk were determined. Fall surveys were conducted to refine data on high-risk locations and continue gathering activity data across the project area. Morning surveys generally consisted of surveying large water bodies within the corridors to gather information on waterfowl presence and activity, while afternoon surveys consisted of gathering data along the remaining, linear portions of the segments.

Post-survey analysis of field data consisted of applying a series of avian-risk factors to the Project segments. These factors were split into two categories: collision factors which increase the risk of collision (i.e., topography, wind direction, and transmission line placement) and ecological resource enhancements which tend to concentrate avian species into certain areas (i.e., nearby water, canyons and valleys). Each factor was then applied to each one-mile interval of all segments using GIS and field data to determine how many total risk factors were present along any given area of the Project (POWER 2010h).

Tables 5 and 6 summarize the field evaluation for TEPS species within the Project area. The potential for Project effects was determined based upon the probability of direct, indirect, and cumulative effects related to the proposed activities. Species will not be carried forward through the effects discussion if the site does not contain suitable habitat, there is no record of occurrence, the species has been extirpated, or other circumstances exist which preclude potential occupancy.

3.0 SPECIES ACCOUNTS AND STATUS OF SPECIES IN THE ANF ACTION AREA

This section provides an overview of the listing status, ecology and local distribution for the sensitive species identified by the Forest Service. The information is based on relevant literature, recovery plans, and data provided by the Forest Service, CDFG, or USFWS. Data from recent Project area surveys conducted from 2008 to 2010 are included, as appropriate. For species listed under the Endangered Species Act (ESA), refer to the BRRTP Biological Assessment.

TABLE 5. LISTED AND FOREST SERVICE SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE ANGELES NATIONAL FOREST AND POTENTIAL TO AFFECT

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Androsace elongata ssp. *acuta* California androsace	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland. 490 – 3,940 feet	March – June	Fed: None CA: None CNPS: 4.2 USFS: Watch List	**Segment D: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment	**Segment I: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Arenaria macradenia var. *kuschei* Kusche's sandwort	Openings in chaparral, on granitic soils. 4,000 – 5,600 feet	June – July	Fed: None CA: None CNPS: 1B.1 USFS Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Arctostaphylos glandulosa ssp. *gabrielensis* San Gabriel Manzanita	Chaparral. 4,995 feet	March	Fed: None CA: None CNPS: 1B.2 USFS Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Unlikely.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Astragalus bicristatus crested milk-vetch	Lower montane coniferous forest, upper montane coniferous forest; sandy or rocky soils, mostly carbonate. 5,580 – 9,005 feet	May – August	Fed: None CA: None CNPS: 4.3 USFS Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Astragalus lentiginosus var. *antonius* San Antonio milk-vetch	Lower montane coniferous forest, upper montane coniferous forest. 4,920 – 8,530 feet in elevation.	April – July	Fed: None CA: None CNPS: 1B.3 USFS Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, and upper montane coniferous forest. 5,994 – 8,660 feet	April – August	Fed: None CA: None CNPS: 1B.2 USFS Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Joshua Tree Woodland and Mojave Creosote Bush Scrub; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.
Botrychium crenulatum scalloped moonwort	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes and swamps. 5,000 – 10,765 feet	June – July	Fed: None CA: None CNPS: 2.2 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Calochortus clavatus var. *gracilis* slender mariposa lily	Chaparral, coastal scrub, and valley and foothill grassland. 1,050 – 3,330 feet	March – June	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Present.** Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Present.** Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Present.** Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Present.** Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Present.** Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	Chaparral, lower montane coniferous forest, meadows, and seeps; mesic soils. 3,300 – 7,840 feet	April – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Calochortus plummerae Plummer's mariposa lily	Coastal scrub, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland; alluvial or granitic, rocky or sandy soils. 325 – 5,580 feet	May – July	Fed: None CA: None CNPS: 1B.2 USFS Sensitive	**Segment D: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.
Calochortus striatus alkali mariposa lily	Alkaline, mesic sites within chaparral, chenopod and Mojavean desert scrub; meadows and seeps. 230 – 5,230 feet	April – June	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive BLM: SS	**Segment D: Possible.** Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Likely.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Calochortus weedii var. *vestus* late-flowered mariposa lily	Chaparral, cismontane woodland, and riparian woodland. 880 – 6,250 feet	June – August	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Canbya candida white pygmy-poppy	Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland; sandy, granitic soils. 1,970 – 4,790 feet	March – June	Fed: None CA: None CNPS: 4.2 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Joshua Tree Woodland and Mojave Creosote Bush Scrub; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible** While suitable habitat is not known on this segment according to GAP data, it is likely that small patches of habitat may be present in the northern portions; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.
Castilleja gleasonii Mt. Gleason Indian Paintbrush	Lower montane coniferous forest, pinyon and juniper woodland; granitic soils. 3,805 – 7,120 feet	May – June	Fed: None CA: SR CNPS: 1B.2 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Castilleja plagiotoma Mojave Indian paintbrush	Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, pinyon and juniper woodland. 980 – 8,200 feet	April – June	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Joshua Tree Woodland and Rabbitbrush Scrub; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible** While suitable habitat is not known on this segment according to GAP data, it is likely that small patches of habitat may be present in the northern portions; and species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.
Chorizanthe parryi var. *parryi* Parry's spineflower	Chaparral, coastal scrub; sandy or rocky openings. 100 – 4,000 feet	April – June	Fed: None CA: None CNPS: 1B.1 USFS: Sensitive	**Segment D: Likely.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Claytonia lanceolata var. *peirsonii* Peirson's spring beauty	Subalpine coniferous forest, upper montane coniferous forest; on scree. 7,005 – 9,005 feet	May – June	Fed: None CA: None CNPS: 1B.1 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Deinandra mohavensis Mojave tarplant	Chaparral, coastal scrub, and riparian scrub; mesic soils. 2,100 – 5,250 feet	June –January	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive BLM: SS	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Dudleya cymosa ssp. *crebrifolia* San Gabriel River dudleya	Chaparral; granitic soils. 900 – 1,500 feet	April – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Unlikely.** Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Dudleya densiflora San Gabriel Mountains Dudleya	Chaparral, coastal scrub, lower montane coniferous forest; in crevices and on decomposed granite on cliffs and canyon walls. 800 – 2,000 feet	March –July	Fed: None CA: None CNPS: 1B.1 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Dudleya multicaulis many-stemmed dudleya	Coastal scrub, chaparral, and valley and foothill grassland; usually on clay soils or grassy slopes. 45 – 2,590 feet	April – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Eriogonum kennedyi var. *alpigenum* Southern alpine buckwheat	Alpine boulder and rock fields, subalpine coniferous forest; granitic, gravelly soils. 8,530 – 11,480 feet	July – September	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Eriogonum microthecum var. johnstonii Johnston's buckwheat	Subalpine coniferous forest, upper montane coniferous forest: rocky soils. 7,300 – 9,515 feet	July – September	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Galium grande San Gabriel bedstraw	Cismontane woodland, chaparral, broadleaved upland forest, lower montane coniferous forest. Microhabitat of open chaparral and low, open oak forest and rocky slopes. 1,400 – 4,920 feet	January – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Likely.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Heuchera abramsii Abram's alumroot	Upper montane coniferous forest; rocky areas. 9,325 – 11,655 feet	July –August	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Heuchera elegans urn-flowered alumroot	Cismontane woodland, lower montane coniferous forest, montane riparian forest, upper montane coniferous forest; rocky habitat. 3,790 – 8,825 feet	May – August	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.
Horkelia cuneata ssp. *puberula* mesa horkelia	Maritime chaparral, cismontane woodland, gravelly or sandy coastal scrub. 230 – 2,660 feet	February – July (Sept. is unusual)	Fed: None CA: None CNPS: 1B.1 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Hulsea vestita ssp. *gabrielensis* San Gabriel Mountains sunflower	Lower and upper montane coniferous forest; rocky habitat. 4,995 – 8,325 feet	May – July	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Hulsea vestita ssp. *pygmaea* pygmy alpine gold	Alpine boulder and rock fields, subalpine coniferous forest; granitic or gravelly sites. 9,440 – 12,990 feet	June – October	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Imperata brevifolia California satintail	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub in mesic soil. 0 – 1,640 feet	September – May	Fed: None CA: None CNPS: 2.1 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Joshua Tree Woodland Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Juglans californica Southern California black walnut	Chaparral, cismontane woodland, and alluvial coastal scrub. 60 – 2,950 feet	March – August	Fed: None CA: None CNPS: 4.2 USFS Watch List	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Lepechinia fragrans fragrant pitcher sage	Chaparral. 70 – 4,360 feet	March – October	Fed: None CA: None CNPS: 4.2 USFS: Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Lepechinia rossii Ross' pitcher sage	Chaparral. 1,000 – 2,590 feet	May - September	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Likely.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Lilium humboldtii ssp. *ocellatum* ocellated lily	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, openings in riparian woodland. 100 – 3,995 feet	March – July (August is unusual)	Fed: None CA: None CNPS: 4.2 USFS: Watch List	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Lilium parryi lemon lily	Upper and lower montane coniferous forest, meadows and seeps, riparian forest; mesic or boggy areas. 4,270 – 8,600 feet	July – August	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Linanthus concinnus San Gabriel linanthus	Lower and upper montane coniferous forest; rocky soils, dry slopes. 5,170 – 9,190 feet	April – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Lupinus peirsonii Peirson's lupine	Joshua tree woodland, lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest; gravelly or rocky sites. 3,280 – 8,325 feet	April – June	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Joshua Tree Woodland; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; and species is not known within 10 miles of segment.
Monardella macrantha ssp. *hallii* Hall's monardella	Broadleaved upland forest, chaparral, lower montane coniferous forest, cismontane woodland, valley and foothill grassland; openings, dry slopes and ridges. 2,395 – 7,200 feet	June –October	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Monardella viridis var. *saxicola* rock monardella	Broadleaved upland forest, chaparral, cismontane woodland. 1,640 – 5,910 feet	July – September	Fed: None CA: None CNPS: 4.2 USFS: Sensitive	**Segment D: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Marginal habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Unlikely.** Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Navarretia peninsularis Baja navarretia	Chaparral (openings) and lower montane coniferous forest; mesic soils. 4,920 – 7,550 feet	June – August	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Opuntia basilaris var. *brachyclada* short-joint beavertail	Chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland; often on sandy soils or coarse, granitic loam. 1,395 – 5,910 feet	April – June	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive BLM: SS	**Segment D: Present.** Species known within segment corridor. Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Present.** Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Present.** Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Likely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment I: Present.** Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**ANF: Present.** Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Likely.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Oreonana vestita woolly mountain-parsley	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest; gravel or talus. 5,380 – 11,655 feet	May – September	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Orobanche valida ssp. *valida* Rock Creek broomrape	Chaparral, pinyon and juniper woodland; granitic soil. 4,100 – 6,560 feet	May – July	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Parnassia cirrata var. *cirrata* fringed grass-of-parnassus	Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest; mesic soils, streamsides, or calcareous habitat. 4,165 – 8,125 feet	August – September	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	Broadleaved upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools or vernally mesic soils. 0 – 1,200 feet	June – October	Fed: None CA: None CNPS: 4.2 USFS: Watch List	**Segment D: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Phacelia exilis Transverse Range phacelia	Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest; sandy or gravelly sites. 3,665 – 8,990 feet	May – August	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Potentilla glandulosa ssp. *ewanii* Ewan's cinquefoil	Lower montane coniferous forest near seeps and springs. 6,330 – 7,990 feet	June – July	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Scutellaria bolanderi ssp. *austromontana* southern mountains skullcap	Chaparral, cismontane woodland, lower montane coniferous forest; mesic soils. 1,400 – 6,660 feet	June –August	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Unlikely.** Marginal habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Unlikely.** Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Unlikely.** Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Species Name[1]	Habitat Requirements[2]	Flowering period[2]	Conservation Status[3]	Potential for Occurrence within the Project Area[4]					
				Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230kV Circuit
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Chaparral, montane coniferous forest; disturbed sites after fire, and grazed land. 3,280 – 8,200 feet.	June – August	Fed: None CA: SR CNPS: 1B.2 USFS Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Sidotheca (=Oxytheca) caryophylloides chickweed oxytheca	Lower montane coniferous forest; sandy habitat. 3,710 – 8,660 feet	July – September	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.
Streptanthus bernardinus Laguna Mountains jewel flower	Chaparral, lower montane coniferous forest. 2,200 – 8,325 feet	May – August	Fed: None CA: None CNPS: 4.3 USFS: Sensitive	**Segment D: Unlikely.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Streptanthus campestris southern jewel flower	Chaparral, lower montane coniferous forest, pinyon and juniper woodland; rocky habitat. 2,950 – 7,660 feet	April – July	Fed: None CA: None CNPS: 1B.3 USFS: Sensitive	**Segment D: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Unlikely.** Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Symphyotrichum (=Aster) defoliatum San Bernardino aster	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grasslands. Found near ditches, streams, or springs. 10 – 7,000 feet	July – November	Fed: None CA: None CNPS: 1B.2 USFS: Sensitive	**Segment D: Likely.** Suitable habitat exists in California Annual Grassland, Mojave Creosote Bush Scrub, and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment	**Segment G: Likely.** Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Likely.** Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Syntrichopappus lemmonii Lemmon's syntrichopappus	Chaparral, Joshua tree woodland, pinyon and juniper woodland; sandy or gravelly habitats. 1,640 – 6,000 feet	April – May	Fed: None CA: None CNPS: 4.3 USFS: Watch List	**Segment D: Possible.** Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment G: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment. **Segment 2a: Possible.** Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment I: Possible.** Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**ANF: Possible.** Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.	**Segment J: Possible.** Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Thelypteris puberula Sonoran maiden fern	Meadows and seeps. 197 – 2,001 feet	January – September	Fed: None CA: None CNPS: 2.2 USFS: Sensitive	**Segment D: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment G: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment. **Segment 2a: Absent.** No suitable habitat exists; elevation is not appropriate; species is not known within 10 miles of segment.	**Segment I: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**ANF: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.	**Segment J: Absent.** No suitable habitat exists; elevation is appropriate; species is not known within 10 miles of segment.

Notes:

1. Sources of scientific names and common names are: Hickman (1993), CNPS (2010) and CalFlora (2010).
2. Sources of habitat characteristics and flowering times are: CNDDB (CDFG 2010), and CNPS (2010).
3. Conservation status designations:

Federal status

FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = candidate for listing

State status

SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SR = listed as Rare under the California Native Plant Protection Act

CNPS designations

List 1B	Plants rare, threatened, or endangered in California and elsewhere
List 2	Plants rare, threatened, or endangered in California, but more common elsewhere
List 3	Plants for which more information is needed; a review list
List 4	Plants of limited distribution; a watch list

CNPS threat extension codes

.1	Seriously endangered in California
.2	Fairly endangered in California
.3	Not very endangered in California
?	Threat status undetermined

Forest Service Sensitive Plants

USFS Sensitive
USFS Watch List

Bureau of Land Management

Sensitive species are those species that are designated by the State Director for special management consideration.

4. Potential to occur within the Project area is based on an analysis of species range and habitat preferences*, using the following criteria:

Is the species known to occur along the segment?
YES–PRESENT

Are the habitat requirements of the species associated with any of the mapped vegetation types for each segment?
Is the elevation range of the species within 500 feet of the elevation range of the segment?
Is the species known within 10 miles of segment?
YES to all three questions—LIKELY
YES to habitat question and one other question—POSSIBLE
YES to habitat question only—UNLIKELY
NO to habitat question—ABSENT

*Note that the "Habitat Requirements" header is based on Holland vegetation types and the "Potential for Occurrence within the Project Area" header was assessed using partially field-verified California GAP vegetation types. The *Index to NDDB/Holland Types* was used to translate between the Holland, CNDDB, and GAP classification systems from the perspective to designate habitat as suitable when in doubt (Sawyer et al. 2009; http://davisherb.ucdavis.edu/cnpsActiveServer/indices.html).

Example: The "Habitat Requirements" for *Androsace elongata* ssp. *acuta* include chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland. Each Holland type was looked up using the *Index to NDDB/Holland Types*. Chaparral corresponded to the chamise, scrub oak – birchleaf mountain-mahogany, and Interior live oak CNDDB types, which correspond to the Chamise Chaparral, Scrub Oak Chaparral, and Interior Live Oak Chaparral GAP types (Southern Mixed Chaparral was also added to this because it fit best and wasn't defined). The cismontane woodland Holland type also corresponded to Interior Live Oak CNDDB type, which corresponded to the Interior Live Oak Chaparral GAP type. The coastal scrub Holland type corresponded to the brittlebush, California buckwheat, and California sagebrush CNDDB types, which correspond to the Mojave Creosote Bush Scrub and Riversidian Sage Scrub GAP types. The valley and foothill grassland Holland type corresponded to the California annual grassland CNDDB type, which corresponds to the California Annual Grassland GAP type. No CNDDB types corresponded to the pinyon and juniper Holland type that also corresponded to any GAP types present in the Project area

TABLE 6. **LISTED AND FOREST SERVICE SENSITIVE WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE ANGELES NATIONAL FOREST AND POTENTIAL TO AFFECT**

Species	Scientific Name	Regulatory Status			Habitat Requirements	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New Circuit
		Federal	State	Other		Segments A, C, D	Segments A, B, G	Segments A, B, G, 2a	Segments A, B, F, I	Segments A, B, G, K	Segment J
San Gabriel Mountain Slender Salamander	*Batrachoseps gabrieli*	FSS			Known only from the San Gabriel Mountains. Found under rocks, wood, fern fronds, and on soil at the base of talus slopes. Most active on the surface in winter and early spring.	A	A	A	A	A	A
Yellow-Blotched Salamander	*Ensatina eschscholtzii croceater*	FSS, BLM S		DFG SC	Forests and well-shaded canyons, as well as oak woodlands and old chaparral. Needs surface objects, such as logs, boards, and rocks. Also needs old rodent burrows or other underground retreats.	A	A	A	A	A	A
Foothill Yellow-Legged Frog	*Rana boylii*	FSS, BLM S		DFG SC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying.	A	A	A	A	A	A
Northern Goshawk	*Accipiter gentilis*	FSS, BLM S		DFG SC	In or near coniferous forests. Nests constructed on north slopes near water in red firs, lodgepole pines, Jeffrey pines, and aspens.	A	A	A	A	A	A
Swainson's Hawk	*Buteo swainsonii*	FSS	ST	USFWS BCC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, agricultural areas, and ranches. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Po	Po	Po	Po	Po	A
Peregrine falcon	*Falco peregrinus*	Delisted, FS Watch list	SE	DFG FP, USFWS BCC	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds, and man-made structures. Nest consists of a scrape on a depression or a ledge in an open site.	Po	Po	Po	U	Po	Po
Bald Eagle	*Haliaeetus leucocephalus*	Delisted, FSS	SE	DFG FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests are within one mile of water. Nests in large, old-growth or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	Po	A	A	A	A	Po
California Spotted Owl	*Strix occidentalis occidentalis*	FSS, FS MIS, BLM S		DFG SC, USFWS BCC	Mixed conifer forest, often with an understory of black oaks and other deciduous hardwoods. Canopy closure >40%. Most often found in deep-shaded canyons, on north-facing slopes, and within 300 meters of water.	U	Po	Po	A	Po	Po
Pallid Bat	*Antrozous pallidus*	FSS, BLM S		DFG SC, WBWG H	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. This species is very sensitive to disturbance of roosting sites.	L	L	L	L	L	Po
Townsend's Big-Eared Bat	*Corynorhinus townsendii*	FSS, BLM S		DFG SC, WBWG H	Occurs throughout California in a variety of habitats, but most common in mesic sites. Roosts in the open, hanging from horizontal and vertical surfaces. Very sensitive to human disturbance.	L	L	L	L	L	Po
Western Red Bat	*Lasiurus blossevillii*	FSS		DFG SC, WBWG H	Roosts primarily in trees, two to 40 feet off the ground. Occurs from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below, with open areas for foraging.	L	L	L	L	L	L
San Gabriel Mountains Bighorn Sheep	*Ovis canadensis nelsoni*	FSS, BLM S			Widely distributed from the White Mountains in Mono County to the Chocolate Mountains in Imperial County. Open, rocky, steep areas with available water and herbaceous forage.	A	A	A	A	A	A

Species	Scientific Name	Regulatory Status			Habitat Requirements	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New Circuit
		Federal	**State**	**Other**		Segments A, C, D	Segments A, B, G	Segments A, B, G, 2a	Segments A, B, F, I	Segments A, B, G, K	Segment J
White-Eared Pocket Mouse	*Perognathus alticolus alticolus*	FSS, BLM S		DFG SC	Ponderosa and Jeffrey pine habitats, also in mixed chaparral and sagebrush habitats in the San Bernardino Mountains. Burrows are constructed in loose soil.	A	A	A	A	A	A
Tehachapi Pocket Mouse	*Perognathus alticolus inexpectatus*	FSS		DFG SC	Arid annual grassland and desert shrub communities, but also found in fallow grain fields and in Russian thistle. Burrows for cover and nesting. Aestivates and hibernates during extreme weather. Forages on open ground and under shrubs.	U	Po	Po	A	Po	A
Los Angeles Pocket Mouse	*Perognathus longimembris brevinasus*	FSS		DFG SC	Lower-elevation grasslands and coastal sage communities in and around the Los Angeles basin. Open ground with fine sandy soils; may not dig extensive burrows, hiding under weeds and dead leaves instead.	A	A	A	A	A	A
Arroyo Chub	*Gila orcutti*	FSS		DFG SC	Los Angeles basin south coastal streams; slow water stream sections with mud or sand bottoms, feeds heavily on aquatic vegetation and associated invertebrates.	U	Po	Po	U	Po	Po
Santa Ana Speckled Dace	*Rhinichthys osculus*	FSS		DFG SC	Headwaters of the Santa Ana and the San Gabriel Rivers, may be extirpated from the Los Angeles River system. Requires permanent flowing streams with summer water temperatures of 17° – 20° C. Usually inhabits shallow cobble and gravel riffles.	A	A	A	A	A	A
California Legless Lizard	*Anniella pulchra*	FSS		DFG SC	Sandy or loose loamy soils under sparse vegetation. Soil moisture essential; this species prefers soils with high moisture content.	U	U	U	Po	U	Po
Southern Rubber Boa	*Charina bottae umbratica*	FSS	ST		Restricted to the San Bernardino and San Jacinto Mountains; found in a variety of montane forest habitats. Found in vicinity of streams or wet meadows, requires loose, moist soil for burrowing. Seeks cover in rotten logs.	A	A	A	A	A	A
Southwestern Pond Turtle	*Actinemys marmorata pallida*	FSS		DFG SC	Requires some slow-water habitat; also, shallow water with emergent vegetation. Nesting requires soils with a high clay or silt fraction to retain moisture. In California, this species is known from only two drainages on the desert slope in California: the Mojave River (San Bernardino County) and Andreas Canyon (Riverside County). From sea level to 1430 meters.	U	Pr	Pr	A	Pr	U
San Bernardino Ringneck Snake	*Diadophis punctatus modestus*	FSS			Most common in open, rocky areas, often in somewhat moist microhabitats near intermittent streams. Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation.	A	Po	Po	A	Po	A
San Bernardino Mountain Kingsnake	*Lampropeltis zonata parvirubra*	FSS		DFG SC	Big cone spruce and chaparral at lower elevations; black oak, incense cedar, Jeffrey pine, and Ponderosa pine at higher elevations. Well-lit canyons with rocky outcrops or rocky talus.	A	A	A	A	A	A

Species	Scientific Name	Regulatory Status			Habitat Requirements	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New Circuit
		Federal	**State**	**Other**		Segments A, C, D	Segments A, B, G	Segments A, B, G, 2a	Segments A, B, F, I	Segments A, B, G, K	Segment J
Coastal Rosy Boa	*Lichanura trivirgata roseofusca*	FSS, BLM S			Desert and chaparral from the coast to the Mojave and Colorado Deserts. Prefers moderate to dense vegetation and rocky cover. Habitats with a mix of brushy cover and rocky soil such as coastal canyons and hillsides, desert canyons, washes and mountains.	L	Pr	Pr	L	Pr	L
Coast (San Diego) Horned Lizard	*Phrynosoma coronatum blainvillii*	FSS		DFG SC	Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions. Prefers friable, rocky, or shallow sandy soils.	Pr	Pr	Pr	L	Pr	Pr
Two-Striped Garter Snake	*Thamnophis hammondii*	FSS, BLM S		DFG SC	Coastal California from vicinity of Salinas to Northwest Baja California. From sea level to approximately 7,000 feet elevation. Highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian vegetation.	U	L	L	Po	L	Po

Listing Status:
U.S. Fish and Wildlife Service (USFWS)
FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FS= listed as Sensitive under the federal Endangered Species Act
FPE= proposed listing under the federal Endangered Species Act
BCC = Bird of Conservation Concern
Delisted = Formerly listed as threatened or endangered under the federal Endangered Species Act
U.S. Forest Service (FS)
FSS = listed as Forest Service Sensitive
MIS = listed as Forest Service Management Indicator Species
Bureau of Land Management (BLM)
S = listed as BLM Sensitive
California Department of Fish and Game (CDFG)
SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SR=listed as Rare under the California Endangered Species Act
SC= listed as Species of Concern
FP = listed as Fully Protected under CDFG Code
Western Bat Working Group (WBWG)
H = listed as High Priority
Other
CA Fur-bearing Mammal = Listed under California Fur-bearing Mammal Statute § 4000 – 4012

Occurrence Code:
A = Absent: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence
U = Unlikely: Species or sign not observed on the site, but conditions marginal for occurrence
Po = Possible: Species or sign not observed on the site, but conditions suitable for occurrence and/or an historical record exists in the vicinity
L = Likely: Species or sign not observed on the site, but reasonably certain to occur on the site based on conditions, species ranges, and recent records
Pr = Present: Species or sign of their presence recent

3.1 SPECIES ACCOUNTS

3.1.1 Plants

Protocol-level field surveys for special-status plants were conducted during spring and summer dates in 2008, 2009, and 2010. Plant species observed within the Project limits are listed in the Appendix. The list is not intended to be comprehensive and include all species present in the area, but only those observed during surveys. The area may support other species not presented in the observed species list that are annuals or only produce vegetative growth immediately after exposure to fire and would not have been growing at the time of the survey. Several sensitive species were observed near the Project area, including slender mariposa lily (*Calochortus clavatus var. gracilis)*, and short-joint beavertail (*Opuntia basilaris var. brachyclada*). Table 5 contains a list of sensitive and listed plant species which could occur within the ANF along with their potentials to occur within the forested Project area. Plants which are determined to be likely to occur or are known within the Project area are described in further detail below with species accounts and direct, indirect, and cumulative impacts. Due to similarities in potential effects for plants within this particular Project area, potential effects are not repeated for each species and are instead grouped together in one section. Watch List species are not repeated below, as they are already listed in Table 5 above.

California Androsace

California androsace (*Androsace elongata* ssp. *acuta*) is a white-flowered annual herb in the Primrose Family (*Primulaceae*) that blooms during March to June (CNPS 2011). California androsace is associated with grassland, chaparral, coastal sage scrub, meadows and seeps, semi-desert shrub, pinyon-juniper woodland, and cismontane woodland at elevations of 490 to 3,940 feet (CNPS 2011). It typically occurs on dry grassy slopes and where vegetation cover is low and mesic conditions are present, such as on and adjacent to moss-covered soil or rock outcrops on north-facing slopes or along rocky washes (Hickman 1993, USFS 2005c). It is the only subspecies of California androsace known from California (USFS 2005c). California androsace is not federally or State listed. It is included on List 4.2 by the CNPS (CNPS 2011) and is included on the Forest Service watch list. Threats to California androsace may include grazing, trampling, fuels and vegetation management, invasive species (primarily cheatgrass), too-frequent fire, and recreational activities (USFS 2005c).

There are historical collections of California androsace from the Elizabeth Lake Canyon in the ANF; a recent collection from Liebre Mountain confirms that this species persists on the ANF (USFS 2005c).

Considering its geographic range and habitat preferences, California androsace has a possible potential to occur on all segments within the Project area. No locations for California androsace were found during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which California androsace may occur are described below.**

Alternative 1 (Segment D): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Alternatives 2, 2a (Segment G): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Alternative 2a (Segment 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Alternative 3 (Segment I): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
New 230 kV Circuit (Segment J): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Kusche's Sandwort

Kusche's sandwort (*Arenaria macradenia* var. *kuschei*) is a white-flowered perennial herb in the Pink Family (*Caryophyllaceae*) that blooms from June to July. This species grows in sunny, rocky openings within a mosaic of chaparral and oak woodland at elevations of 4,000 to 5,600 feet (CNPS 2011). All occurrences are on decomposed granite and are found in areas of gentle relief (USFS 2005c). It is included on CNPS List 1B.1 (CNPS 2011). Threats to Kusche's sandwort occur from motorized recreational use and construction and maintenance of fuel breaks (USFS 2005c).

Kusche's sandwort appears to be endemic to the Liebre Mountain area. It was rediscovered in 1995 on Liebre Mountain in northern Los Angeles County, on ANF land. A 1997 survey of potential habitat on Liebre Mountain and adjacent areas located six new populations (USFS 2005c). The Consortium of California Herbaria (Jepson Online Interchange 2011) lists 12 specimens of this taxon, all from the Liebre Mountain area.

Based on its geographic range and habitat preferences, Kusche's sandwort has a possible potential to occur on Segments G, 2a, I, and the reconductoring area, and an unlikely potential to occur on Segments D or J in the Project area. Kusche's sandwort was not observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Kusche's sandwort may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

San Gabriel Manzanita

San Gabriel manzanita *(Arctostaphylos glandulosa* ssp. *gabrielensis)* is an evergreen shrub with red berries in the Heath Family (*Ericaceae*) that blooms in March (CNPS 2011). This species is associated with rocky outcrops in chaparral at an elevation of 4,995 feet (Hickman 1993, CNPS 2011). It is included on CNPS List 1B.2 (CNPS 2011). San Gabriel manzanita is threatened by power line construction and is known only from one occurrence on Mill Creek Summit divide in the San Gabriel Mountains, on ANF land (CDFG 2011, CNPS 2011).

Based on its geographic range and habitat preferences, San Gabriel manzanita has an unlikely potential to occur on Segments D, G, 2a, I, the reconductoring area, or J. San Gabriel manzanita was not observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which San Gabriel manzanita may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Unlikely. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Big Bear Valley Milk-vetch

Big Bear Valley milk-vetch *(Astragalus lentiginosus* var. *sierrae)* is a perennial herb in the Pea Family (*Fabaceae*). It blooms during April to August with whitish, pink-tinged flowers that develop into bladdery fruits (CNPS 2011). This species occurs in rocky meadows and pine woodlands and is associated with Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, and upper montane coniferous forest (Hickman 1993, CNPS 2011). It is included on CNPS List 1B.2 and is a Forest Service Sensitive species (CNPS 2011). It is known from 19 occurrences and occurs in the project county of Ventura (CDFG 2011).

There are no known populations of this species near the Project area. Based on its geographic range and habitat preferences, Big Bear Valley milk-vetch has an unlikely potential to occur on Segment D and is expected to be absent on all other segments. Big Bear Valley milk-vetch was not observed during botanical surveys conducted for this project in 2008, 2009, or 2010 on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Big Bear Valley milk-vetch may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Joshua Tree Woodland and Mojave Creosote Bush Scrub; elevation is not appropriate; and species is not known within 10 miles of segment.

Slender Mariposa Lily

Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) is a bulbiferous herb in the Lily Family (*Liliaceae*). This species has yellow flowers that are reddish-brown at the base and it blooms during March to June (CNPS 2011). It occurs in shaded foothill canyons associated with chaparral, coastal scrub, and valley and foothill grassland, at elevations of 1,050 to 3,330 feet (Hickman 1993, CNPS 2011). There are 54 occurrences of this species rangewide, all in Los Angeles and Ventura Counties (CDFG 2011).

Slender mariposa lily is not federally or State listed, nor is it included on the list of California BLM Special Status Plants (BLM 2009). The CNPS places it on List 1B, meaning that it is considered rare and endangered (CNPS 2011). Its CNPS threat extension code is .2, indicating it is fairly endangered in California (CNPS 2011). In addition, it is a Forest Service sensitive species.

The *Revised Land and Resource Management Plan* for the ANF (USFS 2005c) states that most sites for this species on non-federal land are threatened by landfill expansion, residential development, sand and gravel mining, and off-highway vehicle activity, and that all *Calochortus* species are vulnerable to removal by collectors, so that rare species such as slender mariposa lily are vulnerable to extirpation as a result (USFS 2005c). The CNPS online Inventory (CNPS 2011) identifies development, mining and vehicles as threats to this species.

This species is known to occur on Project segments D, G, I, the reconductoring area, and J. In the 2008 and 2009 surveys conducted for this Project, slender mariposa lily was found in 62 locations on Segments D, G, and I in recently burned chaparral, coastal scrub, and grassland vegetation (POWER 2008a, POWER 2010b). In 2010 it was found in five additional locations on Segments D and J (POWER 2010c). A total of 28 individuals were found within disturbance areas on Alternative 1; 4,081 individuals within Alternative 2, 2a, and the reconductoring; 420 on Alternative 3; and 13 on the new 230 kV circuit. Based on range and habitat preferences, slender mariposa lily has a likely potential to occur on Segment 2a. **Segments in which slender mariposa lily occurs or may occur are described below.**

Segment D (Alternative 1): Present. Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; but species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Present. Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Present. Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Present. Species known within segment corridor. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Present. Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.

Palmer's Mariposa Lily

Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*) is a bulb-forming herb in the Lily Family (*Liliaceae*). Habitat for Palmer's mariposa lily includes meadows, seeps, and vernally moist areas in chaparral, mixed conifer forest, and yellow pine forest at elevations of 3,300 to 7,840 feet (Hickman 1993, USFS 2005c, CNPS 2011). It has white to lavender flowers and blooms from April to July. Palmer's mariposa lily appears to have an "endurer" life history strategy for coping with wildfire, with most bulbs able to survive fire and to produce enough seed by the second year after the fire to increase reproductive output (USFS 2005c).

It is not federally or State listed, but is included in the CNPS Inventory (2011) on List 1B.2. In addition, it is considered a Sensitive species by the Forest Service. Potential threats include overgrazing, trampling, flooding, erosion, off-highway vehicles, and development projects (USFS 2005c). Palmer's mariposa lily is most vulnerable to impacts from grazing between April and August, when the plant is flowering and setting seed. All *Calochortus* species are vulnerable to removal by collectors, and rare species such as this are vulnerable to extirpation as a result (USFS 2005c).

Palmer's mariposa lily is endemic to Southern California. It has been documented in mountainous areas of San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Kern, San Bernardino, and Riverside Counties (CNPS 2011). The CNDDB (CDFG 2011) lists 81 occurrences, of which most are in San Bernardino and Kern Counties, and four are from the ANF in Los Angeles County. According to the Forest Service (2005), occurrences in the ANF include Mystic Canyon and Little Rock Creek in the San Gabriel Mountains, and west of the Angeles Crest. None of these are in the vicinity of the Project area.

Based on range and habitat preferences, Palmer's mariposa lily has a likely potential to occur on Segment G; a possible potential to occur on Segments D, 2a, and I, and an unlikely potential to occur on Segment J. No individuals of this species were observed during 2008, 2009, or 2010 botanical surveys within ANF lands of the Project area (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Palmer's mariposa lily may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Plummer's Mariposa Lily

Plummer's mariposa lily (*Calochortus plummerae*) is a pink-flowered bulb-forming herb in the Lily Family (*Liliaceae*). It grows on rocky, granitic soils, or on gravelly alluvium, usually in chaparral or coastal sage scrub habitats, and less often in grasslands, alluvial fan sage scrub, oak woodland, or Ponderosa pine woodland (USFS 2005c). It ranges from 325 to 5,580 feet in elevation but is less abundant at higher elevations (CNPS 2011). It is not federally or State listed, but is included on List 1B.2 of the CNPS Inventory (CNPS 2011). It blooms from May to July (CNPS 2011). Plummer's mariposa lily is threatened by development projects, trail construction and maintenance, fire suppression, habitat conversion, trampling, and sand and gravel mining (USFS 2005c), and possibly threatened by invasive non-native plants (CNPS 2011). All *Calochortus* species are vulnerable to removal by collectors, and rare species such as this are vulnerable to extirpation as a result (USFS 2005c).

Plummer's mariposa lily is endemic to Southern California. It has been documented in mountain ranges in Los Angeles, Orange, Riverside, San Bernardino and Ventura Counties. The CNDDB (CDFG 2011) lists 208 occurrences for this species. Most of these are in San Bernardino, Los Angeles, and Riverside Counties. Most occurrences within the ANF are from the San Gabriel Mountains (USFS 2005c).

Based on range and habitat preferences, Plummer's mariposa lily has a likely potential to occur on Segments D, G, I, the reconductoring area, and J, and a possible potential to occur on Segment 2a. Suitable habitat is found within chaparral and grassland vegetation, but there are no recent observations of this species in the vicinity of the Project area. No individuals of Plummer's mariposa lily were observed during 2008, 2009, or 2010 protocol-level surveys within ANF lands of the Project area (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Plummer's mariposa lily may occur are described below.**

Segment D (Alternative 1): Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Likely. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.

Alkali Mariposa Lily

Alkali mariposa lily (*Calochortus striatus*) is a pink-flowered bulb-forming herb in the Lily Family (*Liliaceae*). It blooms from April to June (CNPS 2011). It grows in seasonally moist alkaline habitats such as alkali meadows, ephemeral washes, vernally moist depressions, and at seeps within saltbush and Mojave Creosote Bush scrub, in calcareous sandy soil, from 230 to 5,230 feet in elevation (Hickman 1993, USFS 2005c, CNPS 2011). Alkali mariposa lily has not been found in soils with surface salts, or in wetter areas with permanent standing surface water. The bulb remains dormant and does not sprout in dry years (USFS 2005c). It is not federally or state listed, but is included on List 1B.2 of the CNPS Inventory (CNPS 2011), and is considered a Sensitive species by the Forest Service and BLM.

Potential threats to alkali mariposa lily include grazing, development, altered hydrology, trampling, road construction and collecting (CNPS 2011). All *Calochortus* species are vulnerable to removal by collectors, and are vulnerable to extirpation as a result (USFS 2005c). Alkali mariposa lily is associated with mesic soils in the desert, and is therefore highly vulnerable to habitat loss and degradation resulting from water diversions that affect hydrology (USFS 2005c).

Alkali mariposa lily is restricted to mesic alkaline sites in Southern California, where it is known from Tulare, Kern, Los Angeles, and San Bernardino Counties (CNPS 2011). It also occurs in southern Nevada. In California it has been documented in the southern Sierra Nevada, the western, central, and southern Mojave Desert, the north base of the San Bernardino Mountains, and the southern San Joaquin Valley. The CNDDB (CDFG 2011) lists 93 occurrences for alkali mariposa lily. There are no confirmed records of alkali mariposa lily on National Forest System lands; a record from Pinyon Flats in the ANF is likely a misidentification (USFS 2005c).

Based on range and habitat preferences, alkali mariposa lily has a likely potential to occur on Segments G, 2a, I, and the reconductoring area, and a possible potential to occur on Segments D and J. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which alkali mariposa lily may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Likely. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Late Flowered Mariposa Lily

Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*) is a pink-flowered bulb-forming herb in the Lily Family (*Liliaceae*). It grows in open, dry, rocky sites in chaparral and cismontane and riparian woodlands, from 880 to 6,250 feet in elevation (CNPS 2011). It is often found on serpentine substrates, but may also occur on sandstone, siltstone and shale substrates (USFS 2005c). Key habitat elements include rocky, open sites with reduced competition from other plants, suggesting a low tolerance of disturbance or a lack of ability to compete with other plants (USFS 2005c). Late-flowered mariposa lily appears to cope with wildfire through an "endurer" life history strategy; most bulbs survive fire, and the plants produce enough seed in the second year following fire to result in an increase in reproductive output (USFS 2005c).

Late-flowered mariposa lily is not federally or State listed. It is on List 1B.2 of the CNPS Inventory (CNPS 2011), and is considered Sensitive by the Forest Service. It flowers from June to August (CNPS 2011). Potential threats include risk from road and fuel break maintenance, fire suppression, grazing, and housing development on private lands (USFS 2005c, CNPS 2011). Late-flowered mariposa lily is endemic to coastal Southern California. Locations have been documented in Kern, Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties (CNPS 2011). There are no documented locations for Los Angeles County or the ANF (CNPS 2011, CDFG 2011).

Based on range and habitat preferences, late-flowered mariposa lily has a possible potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. However, there are no known locations for this species within Los Angeles County or the ANF. This species was not found during the 2008, 2009 or 2010 protocol-level surveys conducted for this Project (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which late-flowered mariposa lily may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

White Pygmy Poppy

White pygmy poppy (*Canbya candida*) is a diminutive annual herb in the Poppy Family (*Papaveraceae*) that blooms from March through May (occasionally June). It is the only species of the genus *Canbya* in California and is easily distinguished from other members of the Poppy Family by its tiny white radial flowers with six petals, six to nine yellow anthers, and basal, entire, linear leaves (Hickman 1993). White pygmy poppy is a CNPS List 4.2, Forest Service Sensitive, and BLM Plant of Interest (USFS 2007, CNPS 2011). White pygmy poppy is threatened by development, vehicles, grazing, mining, and non-native plants (CNPS 2011).

White pygmy poppy occurs in the western Mojave Desert adjacent to the Sierra Nevada Mountains in Imperial, Kern, Inyo, San Bernardino and Los Angeles Counties. White pygmy poppy may be found in sandy, gravelly or granitic soils in Joshua Tree Woodland, Mojavean desert Scrub, and Pinyon-Juniper Woodland from 1,970 to 4,790 feet (Hickman 1993, CNPS 2011). The nearest known occurrence is in the San Fernando USGS Quadrangle near the interchange of Interstates 5 and 210 (CalFlora 2011). White pygmy poppy was not observed within the survey area and is not known to occur in the Project vicinity.

Based on range and habitat preferences, white pygmy poppy has a possible potential to occur on Segments D and I. This species was not found during the 2008, 2009, or 2010 protocol-level surveys conducted for this Project (POWER 2008a, POWER 2010b, POWER 2010c). It is expected to be absent from all other forested parts of the Project area. **White pygmy poppy may occur on the following segments:**

Segment D (Alternative 1): Possible. Suitable habitat exists in Joshua Tree Woodland and Mojave Creosote Bush Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. While suitable habitat is not known on this segment according to GAP data, it is likely that small patches of habitat may be present in the northern portions; elevation is appropriate; and species is known within 10 miles of segment.

Mojave Indian Paintbrush

Mojave Indian paintbrush (*Castilleja plagiotoma*) is a hemiparasitic perennial herb in the Figwort Family (*Scrophulariaceae*). This species has pale yellow, white woolly flowers and blooms during April to June (CNPS 2011). It is associated with Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland at elevations of 980 to 8,200 feet (CNPS 2011). It is on CNPS List 4.3 and a Forest Service Sensitive species and is threatened by recreational and road activities (CNPS 2011).

Based on range and habitat preferences, Mojave Indian paintbrush has a possible potential to occur on Segments D and I, but is not expected to occur on any other forested portions of the Project. This species was not found during the 2008, 2009, or 2010 protocol-level surveys conducted for this Project (POWER 2008a, POWER 2010b, POWER 2010c). **Mojave Indian paintbrush may occur on the following segments:**

Segment D (Alternative 1): Possible. Suitable habitat exists in Joshua Tree Woodland and Rabbitbrush Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. While suitable habitat is not known on this segment according to GAP data, it is likely that small patches of habitat may be present in the northern portions; elevation is appropriate; and species is known within 10 miles of segment.

Parry's Spineflower

Parry's spineflower (*Chorizanthe parryi* var. *parryi*) is a white-flowered annual herb in the Buckwheat Family (*Polygonaceae*) that flowers from April to June (CNPS 2011). It occurs in sandy places associated with coastal sage scrub, chaparral, alluvial wash scrub, cismontane woodland, and the ecotone between chaparral and oak woodland, from 100 to 4,000 feet in elevation (Hickman 1993, CNPS 2011, USFS 2005c). Parry's spineflower is not federally or State listed, but is included on List 1B.1 on the CNPS online Inventory (CNPS 2011) and is a Forest Service Sensitive species. Parry's spineflower is threatened by altered hydrologic regimes, development, mining, and vehicles (CNPS 2011).

Parry's spineflower is endemic to Southern California, where it has been documented in alluvial fans and terraces in San Bernardino, Riverside, Los Angeles, and Orange Counties (CNPS 2011, CDFG 2011). The CNDDB (CDFG 2011) lists 94 occurrences; most of these are from Riverside and San Bernardino Counties. There are no documented occurrences from ANF lands except for one uncertain identification from 1902 (CDFG 2011).

Based on range and habitat preferences, Parry's spineflower has a likely potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. Some possibly suitable habitat occurs in scrub and chaparral within the Project area. However, there are no known locations within the vicinity of the Project area. No individuals of this species were found during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Parry's spineflower may occur are described below.**

Segment D (Alternative 1): Likely. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Likely. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Likely. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.

Mojave Tarplant

Mojave tarplant (*Deinandra mohavensis*) is an annual herb in the Sunflower Family (*Asteraceae*) that blooms from June to January (CNPS 2011). It is distinguished from other members of the genus *Deinandra* by its lack of spines on the leaves, yellow anthers, lanceolate upper leaves and whitish stems. Other distinct taxonomic features include five ray flowers, six disk flowers, linear phyllaries, a dense inflorescence and sub-entire basal leaves (Hickman 1993). Mojave tarplant is State listed as endangered.

It is a CNPS List 1B.3, Forest Service Sensitive, and BLM SS species (USFS 2007, CNPS 2011). Mojave tarplant occurs between 2,100 and 5,250 feet in elevation and is threatened by development, grazing, hydrological alterations, recreational activities, road maintenance, and vehicles (CNPS 2011). Mojave tarplant is endemic to Kern, Riverside, San Bernardino and San Diego Counties in chaparral and coastal and riparian scrub (CNPS 2011). According to CalFlora (2011), there are 155 records of Mojave tarplant, while CNDDB (CDFG 2011) lists 66 occurrences with none in the ANF. Populations nearest to the Project area occur in Kern County between Lancaster and Ridgecrest and in San Bernardino County near Apple Valley.

Based on range and habitat preferences, Mojave tarplant has a likely potential to occur on Segment G and the reconductoring area; a possible potential to occur on Segments D, 2a, I, and J. No individuals of Mojave tarplant were observed during 2008, 2009, or 2010 surveys conducted for this Project on federal lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Mojave tarplant may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

San Gabriel River Dudleya

San Gabriel River dudleya (*Dudleya cymosa* ssp. *crebrifolia*) is a perennial herb in the Stonecrop Family (*Crassulaceae*). It has mustard yellow flowers and blooms during April to July (CNPS 2011). It occurs on granitic slopes and is associated with chaparral habitats at elevations of 900 to 1,500 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.2 and Forest Service Sensitive species. This species is threatened by mining and is only known from one occurrence near the San Gabriel River in Los Angeles County (CDFG 2011, CNPS 2011).

Based on current range and habitat preferences, San Gabriel River dudleya is unlikely to occur on all components. No individuals of San Gabriel River dudleya were located during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which San Gabriel River dudleya may occur are described below.**

Segment D (Alternative 1): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Unlikely. Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment J (New 230 kV Circuit): Unlikely. Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

San Gabriel Mountains Dudleya

San Gabriel Mountains dudleya (*Dudleya densiflora*) is a white- or pink-flowered perennial herb in the Stonecrop Family (*Crassulaceae*) that blooms during March to July. It occurs at elevations from 800 to 2,000 feet on steep, granitic cliff and canyon walls and is associated with chaparral, coastal scrub, lower montane coniferous forest, and cismontane woodland (Hickman 1993, CNPS 2011). It is a CNPS List 1B.1 and Forest Service Sensitive species that is threatened by mining, development, and possible horticultural collecting (CNPS 2011). There are six occurrences in California, all in Los Angeles County (CDFG 2011).

Based on current range and habitat preferences, San Gabriel Mountains dudleya has a possible potential to occur on Segments D, G, the reconductoring area, and J, and an unlikely potential to occur on Segment 2a. No individuals of San Gabriel Mountains dudleya were located during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which San Gabriel Mountains dudleya may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Many-stemmed Dudleya

Many-stemmed dudleya (*Dudleya multicaulis*) is a yellow-flowered succulent perennial herb in the Stonecrop Family (*Crassulaceae*) that blooms from April to July (CNPS 2011). It is associated with open sites within chaparral, coastal scrub, and valley and foothill grassland, in dry stony soils, often with high clay content, from 45 to 2,590 feet in elevation (Hickman 1993, CNPS 2011, USFS 2005c). Many-stemmed dudleya is not federally or State listed, but is on List 1B.2 of the CNPS online Inventory (CNPS 2011) and is a Forest Service Sensitive species. Many-stemmed dudleya is seriously threatened by development, road construction and maintenance, fire suppression, invasive non-native plants, mining, grazing, and recreation (CNPS 2011).

Many-stemmed dudleya is endemic to the coastal and foothill areas of Los Angeles, Orange, western San Bernardino, western Riverside, and San Diego Counties. The CNDDB (CDFG 2011) lists 116 occurrences for this species; most of these are on private land in Orange County. There are no known localities on the ANF (USFS 2005c).

Based on current range and habitat preferences, many-stemmed dudleya has a likely potential to occur on Segment G and the reconductoring area, and a possible potential to occur on Segments D, 2a, I, and J. Marginally suitable habitat may occur within chaparral habitat within the Project area; however, there are no known locations within the vicinity of the Project area. No individuals of many-stemmed dudleya were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which many-stemmed dudleya may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

San Gabriel Bedstraw

San Gabriel bedstraw (*Galium grande*) is a yellow-flowered sprawling semi-woody perennial in the Bedstraw Family (*Rubiaceae*) that blooms from January to July (CNPS 2011). It grows in chaparral, open broad-leaved upland forests, cismontane woodlands, and lower montane conifer forests at elevations of 1,400 to 4,920 feet (CNPS 2011). It is not federally or State listed. The CNPS online Inventory includes it on List 1B.2 (CNPS 2011), and the Forest Service considers it to be a Sensitive species. This species is possibly threatened by trail and road use and maintenance, firebreak maintenance, transmission line construction, and recreation (CNPS 2011, USFS 2005c).

San Gabriel bedstraw is endemic to Los Angeles County in the San Gabriel Mountains, and possibly the Liebre Mountains. Eight of the nine recorded occurrences are on the ANF (CDFG 2011); none of these are in the vicinity of the Project area. The closest occurrence to the Project is approximately 3.5 miles west northeast of Castaic Lake (CDFG 2011). ANF has adopted species management guidelines for San Gabriel bedstraw (CNPS 2011).

Based on current range and habitat preferences, San Gabriel bedstraw has a likely potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. No known locations are found within the vicinity of the Project area. This species was not found during the 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which San Gabriel bedstraw may occur are described below.**

Segment D (Alternative 1): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.

Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Likely. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Likely. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.

Urn-flowered Alumroot

Urn-flowered alumroot (*Heuchera elegans*) is a rhizomatous herb in the Saxifrage Family (*Saxifragaceae*). It generally has white flowers and blooms during May to August (CNPS 2011). It occurs in rocky areas in cismontane woodland, lower montane coniferous forest, montane riparian forest, and upper montane coniferous forest at elevations of 3,790 to 8,825 feet (Hickman 1993, CNPS 2011). It is a CNPS List 4.3 and Forest Service Sensitive species and is threatened by foot traffic (CNPS 2011).

Based on current range and habitat preferences, urn-flowered alumroot has a possible potential to occur on Segments 2a and I. This species was not found during the 2008, 2009, or 2010 protocol level surveys conducted for this Project (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which urn-flowered alumroot may occur are described below.**

Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Mesa Horkelia

Mesa horkelia (*Horkelia cuneata* ssp. *puberula*) is a perennial herb in the Rose Family (*Rosaceae*) that flowers during February to July (September is unusual). It occurs in dry, sandy, or gravelly maritime chaparral, coastal scrub, and cismontane woodland, at elevations of 230 to 2,660 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.1 and Forest Service Sensitive species that is possible threatened by habitat conversion (CNPS 2011). There are 58 occurrences in California, 26 which are in Los Angeles and Ventura Counties (CDFG 2011, CNPS 2011).

Based on current range and habitat preferences, urn-flowered alumroot has a possible potential to occur on Segments 2a and I. This species was not found during the 2008, 2009, or 2010 protocol level surveys conducted for this Project (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which urn-flowered alumroot may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment I (Alternatives 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

California Satintail

California satintail (*Imperata brevifolia*) is a rhizomatous perennial grass in the Grass Family (*Poaceae*) that blooms from September to May (CNPS 2011). It occurs at wet springs, meadows, streamsides, and floodplains and is associated with mesic sites within chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkaline), and riparian scrub, from 0 to 1,640 feet (Hickman 1993, CNPS 2011). It is not federally or State listed. The CNPS online Inventory includes it on List 2.1 (CNPS 2011), and the Forest Service tracks it as a Sensitive species. This species is threatened by development and agriculture (CNPS 2011).

Within California, this species is known from Butte, Fresno, Imperial, Inyo, Kern, Lake, Los Angeles, Orange, Riverside, San Bernardino, Tehama, Tulare, and Ventura Counties (CNPS 2011). The CNDDB (CDFG 2011) lists 29 occurrences for California satintail, including two within the ANF, but there are no known locations within the vicinity of the Project area.

Based on current range and habitat preferences, California satintail has a possible potential to occur on Segments D, G, I, the reconductoring area, and J, and an unlikely potential to occur on Segment 2a. The Project area has very few mesic sites, and no locations are known in the vicinity. No individuals of this species were found during 2008, 2009, or 2010 protocol-level surveys within the Project area on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which California satintail may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Joshua Tree Woodland Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternatives 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Southern California Black Walnut

Southern California black walnut (*Juglans californica*) is a tall deciduous tree in the Walnut Family (*Juglandaceae*) that blooms from March through August (CNPS 2011). Southern California black walnut occurs along slopes, canyons, and valleys within chaparral, coastal scrub, and cismontane woodlands at elevations of 160 to 2,950 feet (Hickman 1993, CNPS 2011). It typically occupies mesic areas such as riparian corridors, floodplains, and north-facing slopes, and prefers soils with high clay content (USFS 2005c). It is not federally or State listed.

The CNPS online Inventory places it on List 4.2 (CNPS 2011), and the Forest Service includes it on their Watch List. Southern California black walnut is threatened by urbanization, grazing, invasive non-native plants, and possibly by a lack of natural regeneration and hybridization with non-native walnut species (CNPS 2011). Southern California black walnut is endemic to Southern California, where it is known from Santa Barbara, Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties (CNPS 2011). Its distribution is fragmented. Large stands are present in Ventura, Los Angeles, and northern Orange Counties (USFS 2005c). On the ANF, the species occurs in Pacoima Canyon in the San Gabriel Mountains (USFS 2005c).

Based on current range and habitat preferences, Southern California black walnut has a possible potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. Marginally suitable habitat is present, but there are no known locations within the vicinity of the Project area. No individuals of Southern California black walnut were found during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Southern California black walnut may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Fragrant Pitcher Sage

Fragrant pitcher sage (*Lepechinia fragrans*) is a pink-flowered shrub in the Mint Family (*Lamiaceae*) that flowers between March and October (CNPS 2011). It is known from chaparral habitat in canyons, between 70 and 4,360 feet in elevation (Hickman 1993, CNPS 2011). Fragrant pitcher sage is not state or federally listed. It is included on List 4.2 of the CNPS online Inventory (CNPS 2011), and the Forest Service Sensitive species list. Potential threats to the species include urbanization, fire management, and loss of habitat due to development (CNPS 2011).

Fragrant pitcher sage is endemic to Southern California, where it is known from the Santa Monica and San Gabriel Mountains, the Channel Islands, and Santa Barbara, Los Angeles, San Bernardino, and possibly Ventura Counties (CNPS 2011, CalFlora 2011). The Consortium of California Herbaria (Jepson Online Interchange 2011) lists 135 specimens of this species; most of these are from the Channel Islands.

It is unclear whether any of these specimens have been collected within ANF lands. The Forest Service notes that there are about 12 occurrences of fragrant pitcher sage on or near the Angeles and San Bernardino National Forests (USFS 2005c).

Based on current range and habitat preferences, fragrant pitcher sage has a possible potential to occur on Segments 2a and I and an unlikely potential to occur on Segments D, G, the reconductoring area, and J. Suitable habitat is present, but there are no known locations within the vicinity of the Project area. No individuals of fragrant pitcher sage were found during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which fragrant pitcher sage may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Ross' Pitcher Sage

Ross' pitcher sage (*Lepechinia rossii*) is a perennial shrub in the Mint Family (*Lamiaceae*) that blooms from May to September. Currently it is only known from chaparral, from 1,000 to 2,590 feet in elevation (CNPS 2011). It is distinguished from other members of the subgenus *Calycinae* by geniculate inflorescence axes, which are bent at 60 to 90° angles relative to the subtending stems. It is also distinguished by the presence of large, foliaceous inflorescence bracts which are generally equaling or exceeding their adjacent flowers in length, and little reduced distally (Boyd and Mistretta 2006).

Ross' pitcher sage is not federally or State listed. It is included on CNPS List 1B, meaning that it is rare and endangered throughout its range (CNPS 2011). The CNPS threat extension of .2 means that it fairly endangered in California. The species is considered Sensitive by the Forest Service. As this species is known to be endemic to Los Angeles and Ventura counties, and known from only three locations in the Western Transverse Range (CDFG 2011), its existence is potentially threatened by logging and mining activities (CNPS 2011). Other conservation concerns include habitat degradation by off-highway vehicle activity, power line maintenance, petroleum exploration and extraction, and anthropogenic changes in fire frequency (Boyd and Mistretta 2006).

Based on current range and habitat preferences, Ross' pitcher sage has a likely potential to occur on segments D, G, 2a, I, the reconductoring area, and J. As of the species description in 2006, two populations had been documented, one in the Liebre Mountains (Los Angeles County) and one in the Topatopa Mountains (Ventura County), both occurring in chaparral on public lands administered by the Forest Service. Ross' pitcher sage was mapped at 13 locations in chaparral habitat along the Midway–Vincent Transmission Line corridor, which is no longer part of the proposed Project (POWER 2010b). The Midway-Vincent Segment was an alternative considered and eliminated. Approximately 137 individual plants were observed. Ross' pitcher sage was not detected in any other locations during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Ross' pitcher sage may occur are described below.**

Segment D (Alternative 1): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Likely. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Likely. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.

Ocellated Lily

Ocellated lily (*Lilium humboldtii* ssp. *ocellatum*) is an orange-flowered bulb-forming monocot in the Lily Family (*Liliaceae*) that blooms from March to July, and uncommonly in August (CNPS 2011). This species occurs in yellow pine forests and openings associated with coastal scrub, chaparral, cismontane woodland, riparian woodland, and in lower montane coniferous forest, between 100 and 5,900 feet in elevation (Hickman 1993, CNPS 2011). Plants on the Cleveland, Los Padres, and San Bernardino National Forests are found in riparian areas and seeps of chaparral canyons (USFS 2005c). Ocellated lily is not State or federally listed. The CNPS online Inventory includes it on List 4.2 (CNPS 2011), and it is included on the Forest Service Watch List. Threats to this species include development and horticultural collecting on the mainland, and feral herbivores on the Channel Islands (CNPS 2011). Potential threats on National Forest lands also include flooding and erosion, recreation, and fuel and vegetation treatments (USFS 2005c).

Ocellated lily is the Southern California subspecies of the Humboldt lily. It is endemic to Southern California, and is widespread, though uncommon, in the Santa Ynez and San Rafael mountains in Santa Barbara County, the Topatopa Mountains of Ventura County, the Santa Monica Mountains and Transverse Ranges of Los Angeles County, the eastern San Gabriel and San Bernardino Mountains of San Bernardino County, the Palomar and Santa Ana Mountains of Riverside County, and the Santa Ana Mountains of San Diego County (Jepson Online Interchange 2011). Ocellated lily is also found on Santa Cruz and Santa Rosa islands (CNPS 2011). The Consortium of California Herbaria lists 192 specimens for this taxon (Jepson Online Interchange 2011), including 49 from Los Angeles County. At least one of these is a recent specimen from the vicinity of the Project area (Liebre Mountain).

Based on current range and habitat preferences, ocellated lily has a possible potential to occur on all segments. One location is documented from the Project vicinity. No individuals of this species were identified during 2008, 2009, or 2010 protocol-level surveys for this Project on ANF land (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which ocellated lily may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Peirson's Lupine

Peirson's lupine (*Lupinus peirsonii*) is a yellow-flowered perennial herb in the Pea Family (*Fabaceae*) that blooms in April to June. It occurs on loose gravel in Joshua tree woodland, lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest, at elevations of 3,280 to 8,325 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.3 and Forest Service Sensitive species. This species is known only from 11 occurrences in Los Angeles County, all on ANF lands in the San Gabriel Mountains (CDFG 2011, CNPS 2011).

Based on current range and habitat preferences, Peirson's lupine has a possible potential to occur on Segment D but is expected to be absent on all other segments. No individuals of this species were identified during 2008, 2009, or 2010 protocol-level surveys for this Project on ANF land (POWER 2008a, POWER 2010b, POWER 2010c). **Peirson's lupine may occur on the following segment:**

Segment D (Alternative 1): Possible. Suitable habitat exists in Joshua Tree Woodland; elevation is appropriate; and species is not known within 10 miles of segment.

Hall's Monardella

Hall's monardella (*Monardella macrantha* ssp. *hallii*) is a rhizomatous herb in the Mint Family (*Lamiaceae*). It has red-orange to yellow tubular flowers and blooms during June to October (CNPS 2011). This species occurs in openings, dry slopes, and ridges associated with broadleaved upland forest, chaparral, lower montane coniferous forest, cismontane woodland, and valley and foothill grassland, at elevations of 2,395 to 7,200 feet (CNPS 2011). It is a CNPS List 1B.3 and Forest Service Sensitive species that is threatened by road maintenance and recreational activities. There are 28 occurrences in California, one which is in Los Angeles County (CDFG 2011).

Based on current range and habitat preferences, Hall's monardella has a possible potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. No individuals of Hall's monardella were observed during 2008, 2009, or 2010 surveys conducted for this project on BLM lands. **Segments in which Hall's monardella may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Rock Monardella

Rock monardella (*Monardella viridis* ssp. *saxicola*) is a rhizomatous herb in the Mint Family (*Lamiaceae*). This species has lavender to purple flowers and blooms during June to September (CNPS 2011). This species occurs on rocky, open slopes and often serpentine soils of montane chaparral, closed-cone coniferous forest, and lower montane conifer forest at elevations of 1640 to 5910 feet (Hickman 1993, CNPS 2011). It is a CNPS List 4.2 and Forest Service Sensitive species and is threatened by development and road maintenance, and possibly by mining and recreational activities (CNPS 2011).

Based on current range and habitat preferences, rock monardella is unlikely to occur on all components. No individuals of rock monardella were observed during 2008, 2009, or 2010 surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which rock monardella may occur are described below.**

Segment D (Alternative 1): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Marginal habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Unlikely. Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Baja Navarretia

Baja navarretia (*Navarretia peninsularis*) is a lavender-flowered annual herb in the Phlox Family (*Polemoniaceae*) that blooms during June to August. This species occurs in wet areas in open forest and is associated with pinyon and juniper woodlands, lower montane coniferous forest, and openings in chaparral at elevations of 4,920 to 7,550 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.2 and Forest Service Sensitive species that is threatened by gold-panning and vehicles (CNPS 2011). There are 16 occurrences in California, 11 which are in Kern and Ventura Counties (CNPS 2011).

Based on current range and habitat preferences, Baja navarretia has a possible potential to occur on Segment I, and an unlikely potential to occur on Segments D, G, 2a, the reconductoring area, and J. No individuals of Baja navarretia were observed during 2008, 2009, or 2010 surveys conducted for this

Project on BLM lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Baja navarretia may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternatives 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Short-joint Beavertail

Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*) is a stem succulent in the Cactus Family (*Cactaceae*). This species has pink-magenta flowers and blooms during April to June (CNPS 2011). This species is associated with chaparral, Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland, at elevations of 1,395 to 5,910 feet (CNPS 2011). It is a CNPS List 1B.2, Forest Service Sensitive, and BLM SS species. Short-joint beavertail is threatened by urbanization, mining, horticultural collecting, grazing, and vehicles, and possibly also by transmission line construction (CNPS 2011).

Based on protocol surveys conducted for this Project in 2008, 2009, and 2010, current range, and habitat preferences, short-joint beavertail is present on Segments D, G, 2a, I, the reconductoring area, and J (POWER 2008a, POWER 2010b, POWER 2010c). A total of 49 individuals were found within disturbance areas on Alternative 1; 84 individuals within Alternatives 2 and 2a, and the reconductoring; five on Alternative 3; and nine on the new 230 kV circuit. **Segments in which short-joint beavertail may occur are described below.**

Segment D (Alternative 1): Present. Species known within segment corridor. Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, Mojave Creosote Bush Scrub, Riversidian Sage Scrub, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Present. Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Likely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment I (Alternative 3): Present. Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
ANF Reconductoring: Present. Species known within segment corridor. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Present. Species known within segment corridor. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is known within 10 miles of segment.

Rock Creek Broomrape

Rock Creek broomrape (*Orobanche valida* ssp. *valida*) is a pink-flowered parasitic perennial in the Broomrape Family (*Orobanchaceae*) that blooms from May to September (CNPS 2011). It grows on decomposed granite in open chaparral and pinyon and juniper woodlands from 4,100 to 6,600 feet in elevation (Hickman 1993, CNPS 2011). Possible threats to Rock Creek broomrape include invasive non-native plants and recreational activities (CNPS 2011). This species is not State or federally listed. It is included on List 1B.2 of the CNPS online Inventory (CNPS 2011) and is a Forest Service Sensitive species. This species is considered to have low vulnerability on NFS lands. For the most part, it inhabits remote terrain that receives few impacts; however, management activities that affect the persistence or stability of the chaparral vegetation could adversely affect the taxon (USFS 2005c).

Rock Creek broomrape is endemic to California. It has been documented in Inyo, Ventura, Los Angeles and San Bernardino Counties (CNPS 2011). The CNDDB (CDFG 2011) lists four occurrences, including two from the ANF. The distribution of Rock Creek broomrape on NFS lands is poorly known (USFS 2005c). Abundance data collected in the past two decades indicates that known occurrences are stable or increasing (USFS 2005c). The total number of plants is estimated at 1,600 with the majority (94 percent) occurring in the San Gabriel Mountains (USFS 2005c).

Based on current range and habitat preferences, Rock Creek broomrape has a possible potential to occur on Segments G, 2a, I, and the reconductoring area, and an unlikely potential to occur on Segments D or J. There are no occurrences known from the vicinity of the Project area. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Rock Creek broomrape may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Gairdner's Yampah

Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*) is an erect, perennial herb in the Carrot Family (*Apiaceae*) that blooms from June to October. It is distinguished from other members of *Perideridea* by its tuberous roots in single clusters (related subspecies tuberous roots are 2-3 clustered), one-pinnate basal leaves (needed for identification) and one-veined petals (Hickman 1993). It occurs in coastal flats, grassland, and pine groves of broadleaf upland forest, chaparral, coastal prairies, valley and foothill grassland and vernal pools below 1,200 feet elevation (CNPS 2011).

Gairdner's yampah occurs throughout northern California and is scarce in Southern California. It may potentially occur in Kern, Riverside, San Bernardino and San Diego counties. It is presumed to be extirpated from Los Angeles, Orange, and San Diego Counties in Southern California if it has ever been present (CNPS 2011). Gairdner's yampah is not federally or State listed, nor is it included on the list of

Forest Service Sensitive Species (USFS 2007). The CNPS places it on List 4, a "watch" list, meaning that it has a limited distribution and any loss of habitat should be noted. Its CNPS threat extension code is .2, indicating it is fairly endangered in California (CNPS 2011).

Based on current range and habitat preferences, Gairdner's yampah has a possible potential to occur on Segments D, I, and J, and an unlikely potential to occur on Segments G, 2a, and the reconductoring area. Gairdner's yampah is not known to occur in the Project vicinity. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Gairdner's yampah may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Suitable habitat exists in California Annual Grassland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Southern Mountains Skullcap

Southern Mountains skullcap (*Scutellaria bolanderi* ssp. *austromontana*) is a rhizomatous herb in the Mint Family (*Lamiaceae*). The flowers are white with a blue-mottled lower lip and bloom during June to August. The species occurs on gravelly soils, streambanks, and oak or pine woodland and is associated with chaparral, cismontane woodland, and lower montane coniferous forest, at elevations of 1,400 to 6,660 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.2 and Forest Service Sensitive species and is threatened by grazing and recreational activities (CNPS 2011).

Based on current range and habitat preferences, Southern Mountains skullcap is unlikely to occur on Segments D, G, 2a, I, the reconductoring area, and J. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). Marginal habitat to support this species is present along these segments. **Segments in which Southern Mountains skullcap occurs or may occur are described below.**

Segment D (Alternative 1): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Unlikely. Marginal habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment I (Alternative 3): Unlikely. Marginal habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Unlikely. Marginal habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Marginal habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Parish's Checkerbloom

Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*) is a perennial herb in the Mallow Family (*Malvaceae*). This species has pale pink to pink-lavender flowers and blooms during June to August. It is associated with sites disturbed from fire or grazing in chaparral, cismontane woodland, and lower montane coniferous forest, at elevations of 3,280 to 8,200 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.2 and Forest Service Sensitive species. Parish's checkerbloom is threatened by urbanization, recreational activities, vegetation/fuels management, alteration of fire regimes, grazing, road maintenance, and possible also by fire suppression activities (CNPS 2011).

Based on current range and habitat preferences, Parish's checkerbloom has a possible potential to occur on Segments G, 2a, I, and the reconductoring area and an unlikely potential to occur on Segments D and J. No individuals of this species were observed during 2008, 2009, and 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Parish's checkerbloom occurs or may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

Laguna Mountains Jewel Flower

Laguna Mountains jewel flower (*Streptanthus bernardinus*) is a perennial herb in the Mustard Family (*Brassicaceae*). This species has light yellow to white flowers and blooms during May to August (CNPS 2011). It is associated with chaparral and lower montane coniferous forest, at elevations of 2,200 to 8,325 feet (Hickman 1993, CNPS 2011). This species is a CNPS 4.3 and Forest Service Sensitive species and is threatened by recreational activities, road maintenance, and vehicles (CNPS 2011).

Based on current range and habitat preferences, Laguna Mountains jewel flower has a possible potential to occur on Segments G, 2a, I, and the reconductoring area and an unlikely potential to occur on Segments D and J. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Laguna Mountains jewel flower occurs or may occur are described below.**

Segment D (Alternative 1): Unlikely. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Southern Jewel Flower

Southern jewel flower (*Streptanthus campestris*) is a perennial herb in the Mustard Family (*Brassicaceae*). The flowers are purple with light yellow bases and light purple tips, and blooms during April to July (CNPS 2011). This species occurs in rocky habitats associated with chaparral, lower montane coniferous forest, and pinyon and juniper woodland, at elevations of 2,950 to 7,660 feet (Hickman 1993, CNPS 2011). It is a CNPS List 1B.3 and Forest Service Sensitive species (CNPS 2011).

Based on current range and habitat preferences, southern jewel flower has a possible potential to occur on Segments D, G, 2a, I, and the reconductoring area and an unlikely potential to occur on Segment J. No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which southern jewel flower occurs or may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Unlikely. Suitable habitat exists in Chamise Chaparral; elevation is not appropriate; and species is not known within 10 miles of segment.

San Bernardino Aster

San Bernardino aster (*Symphyotrichum defoliatum*) is a perennial rhizomatous herb in the Sunflower Family (*Asteraceae*) that blooms from July to November. San Bernardino aster ranges from 40 to 100 cm in height with strigose foliage. Its many ray flowers are white to pale violet with yellow disk flowers (Hickman 1993). It occurs in grasslands and disturbed plants associated with vernally mesic areas near ditches, streams and springs in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps and valley and foothill grassland below 7,000 feet in elevation (Hickman 1993, CNPS 2011).

San Bernardino aster is known to occur in Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo and San Diego Counties (CNPS 2011). San Bernardino aster is a Forest Service Sensitive species (USFS 2007) but is currently not State or federally listed. CNPS places it on

List 1B (rare, threatened, or endangered in California and elsewhere), with a threat extension code of .2, indicating it is fairly endangered in California (CNPS 2011).

Based on current range and habitat preferences, San Bernardino aster has a likely potential to occur on Segments D, G, and the reconductoring area and a possible potential to occur on Segments 2a, I, and J. The nearest known occurrence is outside of the Project vicinity in the eastern foothills of the Tehachapi Mountains (CalFlora 2011). No individuals of this species were observed during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which San Bernardino aster may occur are described below.**

Segment D (Alternative 1): Likely. Suitable habitat exists in California Annual Grassland, Mojave Creosote Bush Scrub, and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.
Segment G (Alternatives 2, 2a): Likely. Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Likely. Suitable habitat exists in California Annual Grassland and Riversidian Sage Scrub; elevation is appropriate; and species is known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Riversidian Sage Scrub; elevation is appropriate; and species is not known within 10 miles of segment.

Lemmon's Syntrichopappus

Lemmon's syntrichopappus (*Syntrichopappus lemmonii*) is a diminutive white-flowered annual herb in the Sunflower Family (*Asteraceae*) that blooms April to May (CNPS 2011). Lemmon's syntrichopappus occurs in chaparral, Joshua tree woodland, and pinyon and juniper woodland in sandy and gravelly habitats, often in decomposed granite, at elevations ranging from 1,640 to 6,000 feet (CNPS 2011). This species is not State or federally listed. It is included on List 4.3 of the CNPS online Inventory (CNPS 2011) and is on the Forest Service Watch List. Potential threats to this species include off-road vehicle damage and exotic annual grass invasion promoted by (and promoting) frequent fire (CNPS 2011, USFS 2005c). This species is tolerant of low to moderate disturbance (USFS 2005c).

Lemmon's syntrichopappus is endemic to California. It has been documented in the inner South Coast Ranges in Monterey County, and from the Transverse Ranges, and the San Gabriel, San Bernardino, and San Jacinto Mountains in Kern, Los Angeles, San Bernardino, and Riverside Counties (CNPS 2011, USFS 2005c). The Consortium of California Herbaria (Jepson Online Interchange 2011) lists 94 specimens for this species, of which 36 are from Los Angeles County. One recent specimen was collected in the Liebre Mountains, in the vicinity of the Project area.

Based on current range and habitat preferences, Lemmon's syntrichopappus has a possible potential to occur on Segments D, G, 2a, I, the reconductoring area, and J. No individuals of this species were found during 2008, 2009, or 2010 protocol-level surveys conducted for this Project on ANF lands (POWER 2008a, POWER 2010b, POWER 2010c). **Segments in which Lemmon's syntrichopappus may occur are described below.**

Segment D (Alternative 1): Possible. Suitable habitat exists in Joshua Tree Woodland, Chamise Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

Segment G (Alternatives 2, 2a): Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment 2a (Alternative 2a): Possible. Suitable habitat exists in Interior Live Oak Chaparral, Scrub Oak Chaparral, and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment I (Alternative 3): Possible. Suitable habitat exists in Chamise Chaparral and Scrub Oak Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
ANF Reconductoring: Possible. Suitable habitat exists in Chamise Chaparral and Southern Mixed Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.
Segment J (New 230 kV Circuit): Possible. Suitable habitat exists in Chamise Chaparral; elevation is appropriate; and species is not known within 10 miles of segment.

3.1.2 Sensitive Wildlife

Various sensitive or listed species could occur within the ANF as presented in Table 6, along with their potentials to occur within the forested Project area. Focused or protocol surveys were conducted for various species and/or suitable habitat within the ANF from 2008 to 2010, including arroyo toad (*Anaxyrus californicus*), California red-legged frog (*Rana draytonii*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), California spotted owl (*Strix occidentalis occidentalis*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and western red bat (*Lasiurus blossevillii*). The potentials for these species to occur as listed in Table 6 are a reflection of the survey results combined with the likelihood of the Project area to support the species for nesting, breeding or foraging activity. The remainder of the species in the table was analyzed according to the above criteria and any additional known occurrence information.

Management Indicator Species (MIS): MIS are selected by the Forest Service because changes in their populations and abundance are believed to indicate the effects of forest management activities (36 CFR 219.19(a)(1) 1982). An assessment was performed to evaluate the potential impacts of the BRRTP on the MIS identified in the 2005 ANF Land Management Plan. Please see Appendix C for the results of the assessment.

Species which are determined to be present, potential, likely or unlikely to occur are described in greater detail below with species accounts and direct, indirect, and cumulative effects. Refer to Table 6 for a brief description on Forest Service listed species that are absent from the Project area.

Swainson's Hawk

Swainson's hawk (*Buteo swainsonii*) is a State Threatened and Forest Service Sensitive species, as well as a USFWS Bird of Conservation Concern.

Swainson's Hawk is a medium-sized hawk with relatively long, pointed wings and a long, square tail. Its breeding habitat includes grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural fields and ranches. Hawks are restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. The loss of agricultural lands to various residential and commercial developments is a serious threat to this hawk throughout California.

It breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, agricultural areas, and ranches. It also requires adjacent suitable foraging areas such as grasslands or alfalfa or grain fields which support rodent populations.

Because its winter range encompasses the Project area, this species may occur within some of the Project's component areas, although in some cases it may only be a migrant passing through. **The Project components in which Swainson's hawk may occur are described below.**

Segment D (Alternative 1): Possible. There are no reported sightings along this segment, although it contains large patches of grassland and shrub habitat.
Segment G (Alternatives 2, 2a): Possible. POWER biologists identified several Swainson's hawks circling over Segment G in 2009 over scattered annual grassland habitat. This segment contains mostly chaparral habitat, with the exception of riparian habitat in San Francisquito Canyon and north of Drinkwater Flats along with grassland north of forest boundaries in the Antelope Valley. The California Aqueduct also runs roughly perpendicular to this segment and provides a water source for any hawks.
Segment I (Alternative 3): Possible. There are no reported sightings along this segment, which is mostly disturbed grassland with sparse shrub cover north of the montane region. The California Aqueduct passes through this segment, providing a possible source of water for nearby birds.
ANF Reconductoring: Possible. POWER biologists identified several Swainson's hawks circling over the reconductoring area in 2009 over scattered annual grassland habitat. This segment contains mostly chaparral habitat, with the exception of riparian habitat in San Francisquito Canyon and north of Drinkwater Flats, along with grassland north of forest boundaries in the Antelope Valley. The California Aqueduct also runs roughly perpendicular to this segment and provides a water source for any hawks.

Peregrine Falcon

The peregrine falcon (*Falco peregrinus*) is a federally Delisted species, State Endangered species, and Forest Service watch list species, as well as a CDFG Fully Protected species and USFWS Bird of Conservation Concern.

It resides near wetlands, lakes, rivers, or other bodies of water, generally on cliffs, banks, dunes, mounds, and man-made structures. The nest consists of a scrape on a depression or a ledge in an open site, or occasionally in an older nest.

Based on available suitable habitat and a lack of reported sightings, this species is not expected to occur throughout most of the Project area. **Segments in which peregrine falcon may occur are described below**.

Segment D (Alternative 1): Possible. There are no reported sightings along this segment, but it contains a large amount of available water at Castaic Lake, Pyramid Lake and Quail Lake. It also has an abundance of nesting habitat in the form of man-made structures in various buildings around Castaic Lake and Templin Highway and the numerous existing power lines that parallel the planned segment.
Segment G (Alternatives 2, 2a): Possible. There are no reported sightings along this segment, but it contains an available water source in San Francisquito Canyon. Appropriate nesting habitat on cliffs and ledges can be found in the large boulders and rock formations along the western side of San Francisquito Canyon, along with the many buildings and existing transmission towers on this segment.
Segment 2a (Alternative 2a): Unlikely. There are no reported sightings along this alternative, which contains a perennial water source in South Portal Creek. There may also be some minimal nesting habitat.
Segment I (Alternative 3): Unlikely. There are no reported sightings along this segment, and it contains limited water availability, which is mainly present in the form of small perennial waterways and the California Aqueduct north of forest boundaries. Appropriate nesting habitat is mainly limited to the numerous existing transmission lines and possibly some rocky areas in the southeastern portion of the segment.
ANF Reconductoring: Possible. There are no reported sightings along this component, but it contains an available water source in San Francisquito Canyon. Appropriate nesting habitat on cliffs and ledges can

be found in the large boulders and rock formations along the western side of San Francisquito Canyon, along with the many buildings and existing transmission towers on this segment.
Segment J (New 230 kV Circuit): Possible. While there are no reported sightings along this segment, there is abundant water near this segment at Castaic Lake and Castaic Lagoon. Seasonal water flows through Castaic and Charlie Creeks. This species may find nesting habitat on existing transmission towers or on or around the dam at Castaic Lake. Peregrine falcon is expected to have a possibility of occurring along Segment J.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a federally Delisted species, but continues to be a State-listed Endangered species and a Forest Service Sensitive species as well as a CDFG Fully Protected species.

It is found in most of North America, though about half of its total population can be found in Alaska. It prefers to use ocean shores, lake margins, and rivers for both nesting and wintering, and most nests will be located within one mile of the water source. It nests in large, old-growth or dominant live trees with open branches, especially Ponderosa pine, and roosts communally in winter. The diet is composed of fish. The bald eagle was declared an endangered species in 1967, and upgraded to "threatened" in 1995. In 2007 the bald eagle was removed from the Endangered Species List, but it remains protected under the Migratory Bird Treaty and the Bald and Golden Eagle Protection Act.

Based on reported sightings and availability of suitable habitat, this species is not expected to occur in most of the Project area. **Segments in which bald eagle may occur while overwintering are described below.**

Segment D (Alternative 1): Possible. There is one reported sighting by an ANF employee near this segment, and there is ample available water for any wintering eagles (N. Sill, personal communication). Castaic Lake, Pyramid Lake, and Quail Lake would provide water for eagles, although sufficient nesting habitat may be limited or fragmented.
Segment J (New 230 kV Circuit): Possible. There are no reported sightings near this segment, but there is ample available water for any wintering eagles at Castaic Lake and Castaic Lagoon. Nesting habitat is limited.

California Spotted Owl

California spotted owl (*Strix occidentalis occidentalis*) is a Forest Service Sensitive and Management Indicator Species, BLM Sensitive species, CDFG Species of Special Concern, and USFWS Bird of Conservation Concern.

At elevations below 1,000 meters, California spotted owls inhabit areas dominated by oaks and other hardwoods, and coniferous forests at higher elevations (Gutiérrez et al. 1995). They prefer to nest and roost in areas with older, large diameter trees and dense canopy coverage (Bias and Gutiérrez 1992). Foraging habitat is more variable and may also possess intermediate aged trees. Tree densities decrease and shrub densities increase as owls descend to wintering habitat at lower elevations (Gutiérrez et al. 1992).

Pair-bonding for California spotted owls begins with paired roosting and male-to-female courtship feeding beginning in February and early March, followed by nest site selection and egg-laying about a month later (Forsman 1984). Spotted owls outside of the Sierra Nevada use platform nests built by other species, laying one brood of four to six eggs per season in March or April (Gutiérrez et al. 1992). Renesting is rarely initiated after nest failure (Kroel and Zwank 1994). Incubation only occurs by the female, and lasts for around 30 days. During this period, food items are provided by the male. The female will brood the young for eight to ten days before beginning to forage for longer periods and spend more time away from the nest, until the young fledge after approximately five weeks. Egg-laying peaks in mid-April. Fledglings generally disperse in September or October after reaching adult weight (Gutiérrez et al. 1995).

The dusky footed woodrat is the predominant prey for California spotted owls outside of the Sierra Nevada Range, particularly in the San Bernardino Mountains (Verner et al. 1992). Other important prey include pocket gophers (*Thomomys* spp.), broad-footed moles (*Scapanus latimanus*), mice (*Peromyscus* spp.), chipmunks (*Eutamias* spp.), and squirrels (Douglas's squirrel [*Tamiasciurus douglasii*], western gray squirrel [*Sciurus griseus*], and California ground squirrel [*Spermophilus beecheyi*]). Insects are the most numerous prey, but contribute a minor amount to total intake in terms of mass (Gutiérrez et al. 1995).

Based on reported sightings and available suitable habitat as located during 2008 and 2009 habitat assessment surveys (POWER 2009b, POWER 2010d), this species is not expected to occur throughout much of the Project area. **Segments on which California spotted owl may occur are described below**.

Segment D (Alternative 1): Unlikely. There are no reported occurrences along this segment, although eight nesting and foraging habitat locations were mapped during focused surveys in 2008 and 2009 (POWER 2009b, POWER 2010d). Three of these areas—Fisher Spring, Liebre Gulch, and Oak Flat Spring—were all deemed to be of moderate quality and were used as calling sites, while the rest of the available habitat on this segment was deemed to be of poor quality and insufficient for calling surveys (POWER 2010d, POWER 2010e).

Segment G (Alternatives 2, 2a): Possible. There are no reported occurrences along this segment, although 12 nesting and foraging habitat locations were mapped during focused surveys in 2008 and 2009 (POWER 2009b, POWER 2010d). Two of these areas—Baird Canyon and Craig Spring—were deemed to be of moderate quality, while five others—Clearwater Canyon, San Francisquito Canyon, Grass Mountain, Pettinger Canyon, and Spunky Canyon—were deemed to be of good quality (POWER 2010d, POWER 2010e). Calling surveys were conducted on all seven of these sites, while the remaining four sites were deemed to be of poor quality and insufficient for calling surveys.

Segment 2a (Alternative 2a): Possible. There are no reported occurrences along this alternative, but focused surveys in 2008 and 2009 identified good quality habitat for this species within South Portal Canyon (POWER 2009b, POWER 2010d). Calling surveys were conducted within this canyon, but no individuals were located (POWER 2010d, POWER 2010e).

ANF Reconductoring: Possible. There are no reported occurrences along this component, although 12 nesting and foraging habitat locations were mapped during focused surveys in 2008 and 2009 (POWER 2009b, POWER 2010d). Two of these areas—Baird Canyon and Craig Spring—were deemed to be of moderate quality, while five others—Clearwater Canyon, San Francisquito Canyon, Grass Mountain, Pettinger Canyon, and Spunky Canyon—were deemed to be of good quality (POWER 2010d, POWER 2010e). Calling surveys were conducted on all seven of these sites, while the remaining four sites were deemed to be of poor quality and insufficient for calling surveys.

Segment J (New 230 kV Circuit): Possible. There are no reported occurrences along this segment, although two nesting and foraging habitat locations were mapped during focused surveys in 2008 and 2009 (POWER 2009b, POWER 2010d). Charlie Canyon was deemed to be poor quality, while Dry Canyon was deemed to be good quality (POWER 2010d). Three calling stations were established in Dry Canyon, which consists of a wide rocky/sandy streambed with groupings of coast live oak (*Quercus agrifolia*) scattered along its edges.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a Forest Service Sensitive species, BLM Sensitive species, CDFG Species of Special Concern, and Western Bat Working Group High Priority species (CDFG 2009).

Pallid bats inhabit low elevation (less than 6,000 feet) rocky arid deserts and canyonlands, and shrub-steppe grasslands, but also occur in higher elevation coniferous forests (greater than 7,000 feet). They are most abundant in xeric ecosystems, including the Great Basin, Mojave, and Sonoran Deserts (Hermanson and O'Shea 1983). Pallid bats roost alone, in small groups, or in large groups composed of hundreds of individuals (Rambaldini 2005). Day and feeding roosts include escarpments and cliffs, caves, mines, trees (especially oak cavities, exfoliating bark, and deciduous trees in riparian areas) and man-made structures such as bridges, barns, porches, bat boxes, and buildings. Roosts are generally warmer than ambient temperature, have unobstructed entrances/exits, and are at such a height that access by terrestrial predators is dissuaded (Rambaldini 2005). Although roost fidelity is common, they may switch day roosts on a daily or seasonal basis.

Pallid bats forage over many habitat types, including shrub-steppe or oak savannah grasslands, Ponderosa pine forests, talus slopes, gravel roads, lava, orchards, and vineyards (Rambaldini 2005). Known prey include a large variety of beetles, centipedes, lepidopterans, moths, praying mantids, scorpions, and termites. Vertebrates, such as geckos, lizards, skink, and small rodents, are taken on occasion (Whitaker et al. 1981). They generally take terrestrial vertebrates, but will also take aerial pray. However, foraging style and diet composition vary within and between populations.

Females typically have one or two pups each year, although incidences of three pups have been reported. Mating generally occurs between October and February, followed by parturition from late April to July, and finally weaning in August. Timing of these events varies across latitudes and between years, and is probably influenced by prey availability and temperature. Populations at higher latitudes and in cooler climates give birth later in the season. Sexual maturity is reached approximately one year after birth, with females maturing quicker than males (Rambaldini 2005). In some cases sexual maturity may take as long as two years to obtain (AGFD 2002). Maternity colonies dissolve between weaning in August and the next mating season in October (Rambaldini 2005).

The pallid bat appears to be particularly sensitive to human disturbance during warm summer months when night roost temperatures are high. At cooler temperatures when their activity levels are low and their arousal rates are much slower, however, they are more tolerant of disturbance (Vaughan and O'Shea 1976). Disturbance of roosts, hibernacula, or maternity colonies is particularly damaging to pallid bats, as is the loss or modification of foraging habitat (Rambaldini 2005). Pesticides in particular have been implicated in the decline of pallid bat populations (AGFD 2002).

The Project area and nearby areas contain trees and man-made structures that may provide suitable roosting habitat for this species. In addition, the Project area provides foraging habitat for this species. The pallid bat was detected at seven of seventy-six sites surveyed from 1996 to 1998 in the mountains and foothills of Southern California (including three sites on the ANF and four sites on the Los Padres National Forest), at elevations ranging from 1,100 to 6,600 feet (Stephenson and Calcarone 1999).

While there are no recent recorded sightings of this species within the Project area, based on availability of roosting and foraging habitat, this species is likely to occur on Alternative 2, Alternative 2a and the reconductoring component within the ANF. **Segments on which pallid bat may occur are described below.**

Segment D (Alternative 1): Likely. This segment contains shrubs and grasslands in its northern portion outside of the ANF, with mostly chaparral and patches of coastal sage scrub on its southern portion. There are rocky outcrops within the lower section of this segment that may provide roosting opportunities, while grasslands in the upper section would provide foraging habitat if the animals can roost close enough.

Segment G (Alternative 2): Likely. This segment contains large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment.

The rock formations and existing buildings would provide roosting habitat for this species, while the chaparral and grassland would provide foraging habitat.

Segment 2a (Alternative 2a): Likely. This segment contains mostly dense chaparral in its northern portion and oak woodland surrounded by chaparral in its southern portion, with a perennial stretch of water in South Portal Creek. Pallid bat is expected to be unlikely to occur along the Alternative 2a. Segment G of Alternative 2a contains large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment. The rock formations and existing buildings would provide roosting habitat for this species, while the chaparral and grassland would provide foraging habitat.

Segment I (Alternative 3): Likely. This segment contains mostly chaparral and riparian habitat in its southern portion and is mostly chaparral, desert scrub, or grassland in its northern portion. There are many buildings along this segment on Sierra Highway that may provide roosting habitat. There are rocky outcrops along this segment that would also provide roosting habitat.

ANF Reconductoring: Likely. This component contains large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment. The rock formations and existing buildings would provide roosting habitat for this species, while the chaparral and grassland would provide foraging habitat.

Segment J (New 230 kV Circuit): Possible. This segment contains mostly chaparral, some patches of coastal sage scrub, and riparian habitat around Castaic Lake and Castaic Lagoon. There are some roosting opportunities around Castaic Lake and Lagoon, and some rocky outcrops around Castaic Power Plant.

Townsend's Big-Eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a Forest Service Sensitive species, BLM Sensitive species, CDFG Species of Special Concern, and Western Bat Working Group High Priority species (CDFG 2009).

Townsend's big-eared bat occurs from sea level to 11,000 feet and is associated with a wide variety of habitat types, including coniferous forests, mixed deciduous forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. It occurs throughout California in a variety of habitats, but is most commonly found in mesic sites. The distribution of Townsend's big-eared bats is strongly correlated with the availability of caves and cave-like roosting habitat, with population centers occurring in areas dominated by exposed, cavity-forming rock and/or historic mining areas (Stephenson and Calcarone 1999). Abandoned mines are particularly important where availability of well-developed caves is low (Stephenson and Calcarone 1999). This species may also roost in man-made structures, particularly at night (AGFD 2003a, Piaggio 2005, Reid 2006). Roosting sites are the most important limiting factor for this species. Summer maternity colonies are single-sex and range in size from a few individuals to several hundred individuals (Piaggio 2005) Winter hibernating colonies are composed of mixed-sex groups, which can range in size from a single individual to colonies of several hundred animals. Roosting site fidelity is largely dependent upon site availability. In coastal California regions, where roosting site availability is found sparingly, fidelity is typically high.

Townsend's big-eared bat forages in association with edge habitats in proximity to a variety of woodlands. They are moth specialists, with over 90% of their diet comprised of lepidopterans. These bats often travel large distances while foraging, including movements greater than 150 kilometers during a single evening. Large foraging distances and home ranges have been documented in California in particular (Piaggio 2005).

Mating generally takes place between October and February in both transitory migratory sites and hibernacula. Maternity colonies form between March and June and timing varies according to local climactic factors. A litter consists of a single pup born between May and July. Dispersal from natal ranges into others appears to primarily be mediated by males, while females remain in the general vicinity of their birthplace (i.e., philopatry).

This bat species is threatened by the loss of clean, open water, modification or destruction of roosting and foraging habitat, and disturbance or destruction of hibernacula, which has been recognized as the foremost threat to this species (Miner and Stokes 2005, Piaggio 2005).

The Project vicinity and nearby areas contain man-made structures that may provide suitable roosting habitat for Townsend's big-eared bats. In addition, the Project area contains suitable foraging habitat for this species. Little is known about the distribution and abundance of this species. The Townsend's big-eared bat was detected at six of seventy-six sites surveyed from 1996 to 1998 in the mountains and foothills of Southern California (one site on the San Bernardino National Forest and five sites on the Cleveland National Forest) (Stephenson and Calcarone 1999). More importantly, it was found at fourteen abandoned mine locations in the northeastern San Bernardino Mountains, with fifty-five individuals observed in one mine (Stephenson and Calcarone 1999). Based on the availability of rocky roosting habitat and grassy and shrubby foraging habitat, Townsend's big-eared bat is likely to occur on the Project segments as described below.

Segment D (Alternative 1): Likely. This segment contains mostly grassland and shrubland in its northern portion with chaparral in its southern portion. There are rocky outcrops near Castaic Power Plant on the east side of Castaic Creek.
Segment G (Alternative 2): Likely. This segment contains large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment.
Segment 2a (Alternative 2a): Likely. This segment contains mostly dense chaparral in its northern portion and oak woodland surrounded by chaparral in its southern portion, with a perennial stretch of water in South Portal Creek. There are some buildings nearby in San Francisquito Canyon. Townsend's big-eared bat is expected to be likely to occur along Alternative 2a. Segment G of Alternative 2a contains large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment.
Segment I (Alternative 3): Likely. This segment contains mostly chaparral and riparian habitat in its southern portion and is mostly chaparral, desert scrub, or grassland in its northern portion. There are many buildings along this segment on Sierra Highway that may provide roosting habitat. There are rocky outcrops along this segment that would also provide roosting habitat.
ANF Reconductoring: Likely. There are large rock formations in San Francisquito Canyon, along with chaparral, grassland, and riparian habitat throughout different parts of the segment.
Segment J (New 230 kV Circuit): Possible. This segment contains mostly chaparral, some patches of coastal sage scrub, and riparian habitat around Castaic Lake and Castaic Lagoon. There are some roosting opportunities around Castaic Lake and Lagoon, and some rocky outcrops around Castaic Power Plant, where this segment ends and Segment D continues.

Western Red Bat

Western red bat (*Lasiurus blossevillii*) is a CDFG Species of Special Concern and Western Bat Working Group High Priority species, and is designated by the Regional Forester as a Forest Service Sensitive species (CDFG 2009).

Its range extends between North, Central, and South America, and it migrates south in the winter for hibernation. Western red bat is closely associated with riparian habitats, particularly those containing willows (*Salix* spp.), cottonwoods (*Populus* spp.) and sycamores (*Platanus racemosa*). This species utilizes riparian trees, shrubs, and leaf litter for roost sites (Stephenson and Calcarone 1999). Red bats roost at sites that provide coverage in every direction, except directly downwards, which allows them to drop from their roosting site to take flight. Other characteristics include the lack of perches below that would allow detection of and access by predators (scrub jays, falcons, accipiters, owls, roadrunners, opossums), the presence of dark ground cover beneath to reduce solar reflection into the roost, the presence and density of nearby vegetation to reduce dust and wind, and a south to southwest aspect (Bolster 2005).

Western red bats feed from the wing, taking such prey items as homopterans, coleopterans, hymenopterans, dipterans, and lepidopterans. Red bats generally begin to forage shortly after sunset. Although some may forage throughout the night, most typically have an initial foraging period followed by a resting period, which is then followed with another minor activity period corresponding to insects that become active several hours before sunrise (Bolster 2005).

Mating occurs in late summer or early fall, but females do not become pregnant until spring. Parturition lasts 80 to 90 days. Females may have litters of up to five pups per year, born between late May and mid-June (AGFD 2003b, Bolster 2005).

Agricultural conversion, reservoir construction, and urban expansion are possible sources of severe habitat loss within the winter and summer habitat of coastal Southern California, as is the loss of mature cottonwood habitat (AGFD 2003b, Miner and Stokes 2005). Disturbance to roosting sites can also have detrimental effects on western red bats.

Riparian tree species utilized as roosting habitat by the western red bat are ubiquitous in some portions of the Project area. Additional potential roosting and forage habitat is provided by the wide-array of shrub species found both in and in close proximity to the Project area. Based on the availability of suitable riparian roosting and foraging habitat, western red bat is likely to occur on Project segments within the ANF as described below.

Segment D (Alternative 1): Likely. There is riparian habitat that is appropriate for this species in the southern portion of this segment, particularly around Castaic Creek.
Segment G (Alternative 2): Likely. There is riparian habitat that is appropriate for this species in San Francisquito Canyon, Bee Canyon, and Pettinger Canyon.
Segment 2a (Alternative 2a): Likely. There is oak woodland along a perennial stretch of South Portal Creek in this alternative. There are also other riparian tree species mixed in with the oak trees. Western red bat is expected to be likely to occur along Segment 2a. Segment G of Alternative 2a also contains riparian habitat that is appropriate for this species in San Francisquito Canyon, Bee Canyon, and Pettinger Canyon.
Segment I (Alternative 3): Likely. There are some riparian trees and vegetation along this segment's Sierra Highway portion and up in its mountainous areas.
ANF Reconductoring: Likely. There is riparian habitat that is appropriate for this species in San Francisquito Canyon, Bee Canyon, and Pettinger Canyon.
Segment J (New 230 kV Circuit): Likely. There are some riparian trees along San Francisquito Canyon, Castaic Lake, and around Castaic Power Plant where this segment terminates.

Tehachapi Pocket Mouse

Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*) is a Forest Service Sensitive species and CDFG Species of Special Concern.

Its habitat includes arid annual grassland and desert shrub communities, but it can also reside in fallow grain fields and Russian thistle. The range extends from the Tehachapi Pass southwest towards Gorman, west to Cuddy Valley near Mount Pinos, and east along the San Gabriel Mountains to Elizabeth Lake. The Tehachapi pocket mouse forages on open ground and under shrubs. It aestivates and hibernates during extreme weather and burrows for cover and nesting in loose, sandy soils ranging between approximately 3,500 and 6,000 feet in elevation.

Based on reported sightings and availability of suitable habitat within this species' preferred regional range and elevation range, this species may occur on several of the Project's segments. **Segments on which Tehachapi pocket mouse may occur are described below.**

Segment D (Alternative 1): Unlikely. There are two recent reported sightings approximately six miles north of this segment in the Tehachapi Mountains (CDFG 2010). The northern section of this segment, outside the ANF boundaries, runs near the base of the Tehachapi Mountains and has stretches of appropriate desert shrub and grassland habitat interrupted by State Route 138, the California Aqueduct, and various residences such as those around the community of Neenach. This segment is approximately 400 to 1,000 feet below the bottom end of this species' preferred elevation range, although there are areas within it that are within the elevation range.

Segment G (Alternatives 2, 2a): Possible. There are no recent recorded sightings of this species near this segment, which is just outside of the species' known range. A historical sighting from 1938 is possibly extirpated (CDFG 2011). The habitat in this area is grassland and chaparral that is interrupted by scattered residences and the community of Elizabeth Lake. This segment is on the edge of the species' preferred elevation range in this area.

Segment 2a (Alternative 2a): Possible. There are no recent recorded sightings of this species near this segment, which is just outside of the species' known range. A historical sighting from 1938 is possibly extirpated (CDFG 2011).The habitat in this area is mainly dense chaparral. This segment is on the edge of the species' preferred elevation range in this area.

ANF Reconductoring: Possible. There are no recent recorded sightings of this species near this component, which is just outside of the species' known range. A historical sighting from 1938 is possibly extirpated (CDFG 2011).The habitat in this area is grassland and chaparral that is interrupted by scattered residences and the community of Elizabeth Lake. This component is on the edge of the species' preferred elevation range in this area.

Arroyo Chub

Arroyo chub (*Gila orcutti*) is a Forest Service Sensitive species and CDFG Species of Special Concern.

It lives in Los Angeles Basin south coastal streams, in slow water stream sections with mud or sand bottoms. It feeds heavily on aquatic vegetation and associated invertebrates. Breeding occurs fairly continuously between February and August, with spawning occurring in waters typically between 14 and 22°C. Their diet includes algae, small insects, and other invertebrates.

Based on reported sightings and availability of suitable habitat, this species is not expected to occur throughout most of the Project area. **Segments in which arroyo chub may occur are described below**.

Segment D (Alternative 1): Unlikely. There are no reported sightings along this segment, but there are isolated spots of appropriate sandy stream bottoms which will have to be crossed for access. However, these areas are believed to be dry most of the year based on 2008 to 2010 surveys and may not support a population of the fish.

Segment G (Alternatives 2, 2a): Possible. This species was identified to POWER by a USGS biologist during a 2009 survey in the St. Francis Dam reach of lower San Francisquito Creek, where deep natural and artificial ponds have been created that hold water perennially in a dense riparian stretch (S. Schuster, personal communication, March 2009). However, upstream of this isolated portion, San Francisquito Creek is not known to be perennial until north of Bee Canyon. The area between Bee Canyon and the known population is intermittent and has been observed to be dry most of the year. Forest Road 5N27, which crosses San Francisquito Creek and allows alternate access between San Francisquito Canyon and

Segment G, will not be used by construction. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present anywhere in San Francisquito Creek upstream of Forest Road 5N27. The access road through Bee Canyon would be used by construction. This would cross through San Francisquito Creek, but multiple arroyo toad and California red-legged frog protocol surveys in 2008 to 2010 at multiple locations in this stretch of the creek failed to incidentally observe any arroyo chub.
Segment I (Alternative 3): Unlikely. There are no reported sightings of this species along this segment, which contains several miles of potentially suitable habitat within Vasquez Canyon and alongside Sierra Highway. However, these streambeds were not observed to be flowing during any of the various surveys which were conducted in 2008 and 2009 for this Project, and may not be able to support a population if there are no perennial water sources.
ANF Reconductoring: Possible. This species was identified to POWER by a USGS biologist during a 2009 survey in the St. Francis Dam reach of lower San Francisquito Creek, where deep natural and artificial ponds have been created that hold water perennially in a dense riparian stretch (S. Schuster, personal communication, March 2009). However, upstream of this isolated portion, San Francisquito Creek is not known to be perennial until north of Bee Canyon. The area between Bee Canyon and the known population is intermittent and has been observed to be dry most of the year. Forest Road 5N27, which crosses San Francisquito Creek and allows alternate access between San Francisquito Canyon and Segment G, would not be used by construction. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present anywhere in San Francisquito Creek upstream of Forest Road 5N27. The access road through Bee Canyon would be used by construction. This would cross through San Francisquito Creek, but multiple arroyo toad and California red-legged frog protocol surveys in 2008 to 2010 at multiple locations in this stretch of the creek failed to incidentally observe any arroyo chub.
Segment J (New 230 kV Circuit): Possible. There are no reported sightings of this species along this segment, which passes over Dry Canyon, San Francisquito Canyon, Charlie Canyon, and Bitter Canyon. None of these canyons has perennially flowing water at the point that the power lines pass over. The streambeds contain combinations of sand and/or rock. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present anywhere in San Francisquito Creek near this Project component.

California Legless Lizard

California legless lizard (*Anniella pulchra*) is designated by the Regional Forester as a Forest Service Sensitive species, and is also listed by the CDFG as a Species of Special Concern.

California legless lizard is a fossorial species associated with sandy or loose loamy soils under the sparse vegetation of coastal strand, chaparral, coastal sage scrub or pine-oak woodland, or under sycamores and cottonwoods in riparian areas (Jennings and Hayes 1994). It also occurs in desert scrub along the western edge of the Mojave Desert near Lancaster and in western portions of the Anza-Borrego Desert State Park. California legless lizards are often found under surface cover such as logs, rocks, and leaf litter, where soil moisture is high, as this characteristic is apparently essential to their survival (Stephenson and Calcarone 1999). Fisher and Case (1997 in Stephenson and Calcarone 1999) described finding this species at several locations in the eastern Santa Ana Mountains within oak woodland, chaparral, and coastal scrub vegetation in decomposing granitic soils. They suggested that the distribution of these lizards in foothill and lower montane habitats may be closely tied to this friable substrate type.

Legless lizards are reasonably tolerant to lower temperatures, preferring temperatures between 20 and 25°C but remaining active above 13°C (Fellers 2009). This allows them to be active on cool days when potentially competing species (e.g., juvenile alligator lizards, skinks) remain inactive. Individuals from coastal and southern localities are probably active year-round with only brief periods of winter inactivity. Lizards from cooler locales (e.g., the Sierra foothills) undergo winter hibernation.

Reproduction begins with mating activities in late spring or early summer. The gestation period is about four months (Jennings and Hayes 1994). Live young are usually born from September to October, and occasionally into November. Litter size ranges from one to four but two is common (Stebbins 2003).

Based on the lack of reported sightings and the availability of suitable habitat, this species is not expected to occur throughout most of the Project area. **Segments in which it may occur are described below**.

Segment D (Alternative 1): Unlikely. There are no reported sightings of this species within this segment, which contains isolated patches of possibly suitable habitat.
Segment G (Alternatives 2, 2a): Unlikely. There are no reported sightings of this species within this segment, which contains limited suitable habitat in various locations near or within streambeds.
Segment I (Alternative 3): Possible. There are no reported sightings of this species within this segment from within the last ten years (CDFG 2010). However, this segment contains large patches of sage scrub mixed with other habitat types that may have loose, sandy soils nearby enough to provide suitable habitat.
ANF Reconductoring: Unlikely. There are no reported sightings of this species along this component, which contains limited suitable habitat in various locations near or within streambeds.
Segment J (New 230 kV Circuit): Possible. There are no reported sightings of this species within this segment, but suitable habitat exists in Dry Canyon and Charlie Canyon. These areas contain sandy substrates—Dry Canyon is also rocky—with coast live oak woodland interspersed throughout the streambed. Charlie Canyon also contains cottonwood (*Populus fremontii*) and *Eucalyptus* trees along its streambed.

Southwestern Pond Turtle

Southwestern pond turtle (*Actinemys marmorata pallida*) is designated by the Regional Forester as a Forest Service Sensitive species, and is also listed by the CDFG as a Species of Special Concern (CDFG 2009).

Southwestern pond turtles are scarce anywhere above 5,000 feet (Holland 1994) and generally inhabit low elevation aquatic habitats below 4,000 feet (Stephenson and Calcarone 1999). In Southern California, southwestern pond turtles are primarily found in rivers and streams that have persistent deep pools or in lacustrine habitats (Holland 1994). However, they are also known to live within disturbed or altered habitat such as reservoirs, gravel pits, stock ponds, and sewage treatment plants, although these animals are often merely displaced (Holland 1994). Pond turtles regularly utilize upland terrestrial habitat, most often during the summer and winter, especially for oviposition (females), mate seeking (males), overwintering, seasonal terrestrial habitat use, and overland dispersal. Most often, overland movement events are part of normal turtle movements within a terrestrial home range, but pond turtles regularly overwinter in uplands, burying themselves beneath the leaf litter. Overwintering sites can be as far as 500 meters from typical watercourses on slopes that range from 0 to 35° and in Southern California are typically utilized for only a month or two before turtles return to the water (Holland 1994). In general, males have exhibited larger home ranges than females (Reese 1996). In a study conducted by Reese (1996) on the Trinity River, male linear home ranges averaged approximately 1,141 meters between the mainstem and south fork of the Trinity River, while females averaged approximately 569 meters; thus males were observed by Reese (1996) to have average home ranges twice as large as females.

Pond turtle egg laying occurs from late April through August with a peak period in June to mid-July. Females build nests between 10 to 12 centimeters deep, in dry, well-drained clayey, loamy, or silty soils (Holland 1994, Reese 1996, Spinks et al. 2003, Bettelheim 2005). Females seem to prefer to build nests on slopes less than 15° (Spinks et al. 2003), but have been observed to range up to 60° (Holland 1994). They are built on south- or west-facing slopes, although nests have been known to face west or northwest (Holland 1994, Buskirk 2002, Bettelheim 2005), at distances ranging from 1.5 to 402 m (average = 45 m) away from water (Holland 1994, Spinks et al. 2003, Bettelheim 2005). Females leave the watercourse in late afternoon and evening, and travel into adjacent wetland margins or uplands to build nests. Most females are believed to oviposit in alternate years, although instances of turtles laying up to two clutches in one year have been recorded in southern and central California (Holland 1994, Ashton et al. 1997, Buskirk 2002, Bettelheim 2005). Once the one to 14 eggs—four to seven eggs on average (Ashton et al. 1997)—are laid in a shallow hole, the female covers it with dirt. Incubating eggs are extremely sensitive to increased soil moisture, which is absorbed by eggs and can subsequently cause them to explode from increased internal pressure (Ashton et al. 1997, Bettelheim 2005). Additionally, nests are highly susceptible to predators as well as to trampling by cattle or people. Hatchlings emerge in approximately 12 weeks.

Hatchling and small juvenile pond turtles require specialized microhabitats characterized by shallow water (usually less than 30 centimeters deep), presence of emergent vegetation, and clusters of small branches in the water. Reese (1996) found that hatchlings and juveniles were more likely to be found in warm, slow-moving portions of river channels (backwater pools, side channels, edgewater pools), ponds, or vernal pools. **Segments in which southwestern pond turtle may occur are described below.**

Segment D (Alternative 1): Unlikely. A population of at least 17 southwestern pond turtles was discovered in Castaic Creek near Castaic Power Plant in fall 2009 and relocated by POWER into Fish Canyon and Cienaga Canyon. While it is possible that the turtles, or others, are again present within this area in Castaic Creek, the proposed ROW is two miles away on the other side of a ridgetop.

Segment G (Alternatives 2, 2a): Present. USGS has identified this species in San Francisquito Canyon during annual surveys in 2002 (USGS 2003), 2003 (USGS 2004), 2007 (USGS 2007), 2009 (USGS 2010), and 2010 (USGS 2011).

ANF Reconductoring: Present. USGS has identified this species in San Francisquito Canyon during annual surveys in 2002 (USGS 2003), 2003 (USGS 2004), 2007 (USGS 2007), 2009 (USGS 2010), and 2010 (USGS 2011).

Segment J (New 230 kV Circuit): Unlikely. A population of at least 17 southwestern pond turtles was identified in fall 2009 in Castaic Creek and subsequently relocated by a POWER biologist upstream into Fish Canyon and Cienaga Canyon. Although this component is within 0.2 mile of Castaic Creek, there is no suitable aquatic habitat within the construction footprint in this area. It is possible that turtles would migrate into the adjacent hillsides for egg-laying and/or overwintering; however, it is more likely that they would utilize the hills north of the creek, as the hills in the construction area—south of the creek—are separated from Castaic Creek by equipment and material staging areas, an employee parking lot, and the Castaic Power Plant itself and its associated electrical components, all of which are areas that have regular or semi-regular human activity.

San Bernardino Ringneck Snake

San Bernardino ringneck snake (*Diadophis punctatus modestus*) is a Forest Service Sensitive species.

It is most commonly found in open, rocky areas, often in somewhat moist microhabitats near intermittent streams. It avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation. **Segments in which San Bernardino ringneck snake may occur are described below.**

Segment G (Alternatives 2, 2a): Possible. Based on reported sightings and the availability of suitable habitat, this species is not expected to occur throughout most of the Project area, with the possible exception of Segment G. Segment G may contain suitable open rocky areas in San Francisquito Canyon west of San Francisquito Canyon Road across from St. Francis Dam reach. The Dam reach may also contain appropriate habitat on its southern end, where there is a very open area with intermittent flow and rocky habitat.

ANF Reconductoring: Possible. Based on reported sightings and the availability of suitable habitat, this species is not expected to occur throughout most of the Project area, with the possible exception of the reconductoring area. This area may contain suitable open rocky areas in San Francisquito Canyon west of San Francisquito Canyon Road across from St. Francis Dam reach. The Dam reach may also contain appropriate habitat on its southern end, where there is a very open area with intermittent flow and rocky habitat.

Coastal Rosy Boa

Coastal rosy boa (*Lichanura trivirgata roseofusca*) is designated by the Regional Forester as a Forest Service Sensitive species, and is a BLM Sensitive species (CDFG 2009).

The coastal rosy boa is primarily associated with rocky habitat in scrub and chaparral, including canyons and washes in more montane habitat (Stephenson and Calcarone 1999, Stebbins 2003, CDFG 2008). It is common in riparian areas, but does not seem to be obligated to permanent water sources (Stebbins 2003, California Herps 2011). It lives in desert and chaparral from the coast to the Mojave and Colorado Deserts. It prefers moderate to dense vegetation and rocky cover, and habitats with a mix of brushy cover and rocky soil such as coastal canyons and hillsides, desert canyons, washes, and mountains. The coastal rosy boa occurs from the foothills of the San Gabriel and San Bernardino Mountains, south through Orange, Riverside, and San Diego Counties.

Coastal rosy boas prefers intermediate temperatures, emerging during dawn, morning, dusk, and at night, but remaining inactive and in a burrow during particularly hot or cold periods. Young are live born during the months of October and November, typically with three to fourteen at a time (Stebbins 2003). Diet consists of small mammals, reptiles, amphibians, and birds. Diet consists of rodents, small birds, lizards, small snakes, and amphibians. **Segments on which coast rosy boa may occur are described below.**

Segment D (Alternative 1): Likely. There are no reported sightings of this species within this segment, but there is suitable desert habitat along the northern half of this segment, which is near the base of the Tehachapi Mountains. The southern half of this segment contains abundant chaparral and is near water sources such as Castaic Lake.
Segment G (Alternatives 2, 2a): Present. This species was identified approximately 0.25 mile from Segment G on an access road to LADWP's Power Plant #1.
Segment 2a (Alternative 2a): Likely. This segment contains abundant chaparral and a perennial stretch of South Portal Creek. This species was identified in summer 2009 on Segment G approximately 2.25 miles from the southern end of this alternative.
Segment I (Alternative 3): Likely. There are no reported sightings of this species within this segment, but there is abundant chaparral along its southern end, with more open areas along its northern end. Water sources are limited. This area is disturbed by Vasquez Canyon Road, Sierra Highway, Elizabeth Lake Road, and various city roads.
ANF Reconductoring: Present. This species was identified approximately 0.25 mile from Segment G on an access road to LADWP's Power Plant #1.
Segment J (New 230 kV Circuit): Present. Based on the presence of suitable habitat this is species is likely to occur on the new conductoring ROW on Segment J.

Coast (San Diego) Horned Lizard

Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*) is a Forest Service Sensitive species and CDFG Species of Special Concern (CDFG 2009).

It inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions, preferring friable, rocky, or shallow sandy soils. Open areas with limited overstory are preferred for basking, with abundant and thick shrubs for refuge (Stephenson and Calcarone 1999). Habitat elevation is typically from sea level to approximately 8,000 feet. Eggs are laid between May and June, and hatch between August and September. Diet consists of mainly ants, but other invertebrates such as spiders, beetles, termites, flies, bees, and grasshoppers are also consumed. Males will typically begin aestivating by the end of July, while females will stay active through the summer to regain body mass following egg-laying, finally aestivating in mid-September (Brown 2009). Hatchlings will stay active into November before beginning aestivation; coast horned lizards are generally not encountered between mid-November and mid-March (Brown 2009).

The coast horned lizard is found generally along the California coastline and partial interior from northern California into Baja California. It has been identified numerous times during surveys within the Project area. **Segments on which coast (San Diego) horned lizard may occur are described below.**

Segment D (Alternative 1): Present. This species has been identified in several CNDDB records close to the proposed ROW (CDFG 2011). POWER also identified this species along Edison Spring Road in 2010.

Segment G (Alternatives 2, 2a): Present. This species has been identified several times by POWER in San Francisquito Canyon, including one sighting approximately 0.15 mile from the proposed ROW.

Segment 2a (Alternative 2a): Present. This species has been identified several times by POWER close to this segment, including one sighting in San Francisquito Canyon approximately 0.75 mile from the proposed ROW and two sightings along Tule Ridge Road approximately 250 feet from the proposed ROW.

Segment I (Alternative 3): Present. There are reported occurrences of this species within two miles of this segment, which contains suitable habitat in the form of chaparral and sandy streambeds (CDFG 2011).

ANF Reconductoring: Present. This species has been identified several times by POWER in San Francisquito Canyon, including one sighting approximately 150 feet from the existing ROW.

Segment J (New 230 kV Circuit): Present. There is one reported occurrence of this species approximately 0.25 mile from this segment, and another approximately 1.3 miles from the segment (CDFG 2010).

Two-Striped Garter Snake

Two-striped garter snake (*Thamnophis hammondii*) is a Forest Service Sensitive species, BLM Sensitive species, and CDFG Species of Special Concern (CDFG 2009).

It lives in coastal California from the vicinity of Salinas to northwest Baja California, occurring from sea level to approximately 8,000 feet in elevation. It is highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian vegetation (Stebbins 2003). Breeding has been observed to occur in late March and early April, with live birth occurring during the summer (Stebbins 2003, CDFG 2008). Diet consists of tadpoles, newt larvae, small frogs and toads, fish, and sometimes worms and fish eggs (Stebbins 2003).

The two-striped garter snake inhabits perennial and intermittent streams from sea level to around 8,000 feet (Stebbins 2003). They also occupy non-natural aquatic habitats, such as stock ponds (Stephenson and Calcarone 1999). Streams are usually bordered by willows or other types of streamside vegetation (Stebbins 2003). The species inhabits oak woodlands, brushlands, and sparse coniferous forests from Monterey County continuously to Baja California. However, loss of wetlands is partially responsible for a reduction in this species' range (California Herps 2011). Two-striped garter snakes are live-bearing, giving birth to 4 to 36 young in the summer. **Segments on which two-striped garter snake may occur are described below.**

Segment D (Alternative 1): Unlikely. Several individuals were identified approximately three miles from this segment in Fish Canyon by POWER biologists in 2009. This segment contains abundant nearby water sources such as Castaic Lake, but is limited in the amount of perennial streams, if any, that are located under the alignment itself. Open water bodies such as Castaic Lake are mostly separated from the proposed ROW by steep mountain slopes. Habitat is mostly chaparral with patches of coastal sage scrub along the southern half and grassland and desert scrub in the northern half.

Segment G (Alternatives 2, 2a): Likely. There are several areas of perennial water that could support this species around LADWP's Power Plant #1 and in the area directly within or in close proximity to the Project ROW known as Drinkwater Flat.

Segment 2a (Alternative 2a): Likely. There is a perennial stretch of water that could support this species in South Portal Canyon along this alternative, along with abundant chaparral and woodlands.

Segment I (Alternative 3): Possible. There are several sightings from one location within one mile of this segment's centerline (CDFG 2011). The most recent sighting was from 1999, although habitat may still be present and sufficient to support this species at this location, despite being directly adjacent to Elizabeth Lake Road. There is limited water elsewhere along this segment besides the California Aqueduct. Habitat ranges from arid grassland to chaparral.

ANF Reconductoring: Likely. There are several areas of perennial water that could support this species around LADWP's Power Plant #1 and in the area directly within or in close proximity to the Project ROW known as Drinkwater Flat.

Segment J (New 230 kV Circuit): Possible. There are no reported sightings of this species along this segment, which contains mainly chaparral, coastal sage scrub, and annual grassland, along with several intermittent streambeds and two large sources of standing water at Castaic Lake and Castaic Lagoon. Several individuals were identified by POWER approximately three miles upstream of the end of this segment in Fish Canyon.

4.0 EFFECTS OF THE PROPOSED PROJECT

In this section, the construction, operation, and maintenance for the construction of the proposed BRRTP are evaluated to determine if Forest Service listed species within the action area could potentially be affected. Potential effects include temporary disturbance and displacement, loss and fragmentation of habitat, and take of individual animal species. Effects are anticipated to result in both direct and indirect impacts. Direct impacts are those which cause immediate responses such as mortality, habitat loss, and disturbance (resulting in behavioral changes such as flushing and displacement). Indirect impacts are those which cause a protracted response, such as increased foraging time or increased roost tree searching due to habitat reduction and/or habitat degradation. Impacts to FS listed species are considered significant if the following criteria are met:

- Jeopardizing the continued existence of a listed species.
- Loss of individuals of a population of species.
- Adversely modifying critical habitat to the degree it would no longer support the species for which it was designated.
- Violation of any State, federal or other applicable statutes and regulations pertaining to special-status species.
- Adverse impacts to habitat used by special-status species for spawning or rearing.

4.1 EFFECTS ANALYSIS

Each BRRTP component within the ANF is analyzed below for potential direct and indirect effects to listed Forest Service species. The impact analysis does not look at Forest Service listed species or their potential habitat outside the ANF boundaries.

4.1.1 Plants

New 230 kV Transmission Line

Alternative 1 – Construction of the proposed new 230 kV transmission line on Alternative 1 could potentially directly affect the following Forest Service Sensitive botanical species that could occur within the transmission line corridor:

Present

- Slender mariposa lily
- Short-joint beavertail

Likely

- Plummer's mariposa lily
- Parry's spineflower
- San Gabriel bedstraw
- Ross' pitcher sage
- San Bernardino aster

Possible

- California androsace
- Palmer's mariposa lily
- Alkali mariposa lily
- Late-flowered mariposa lily
- White pygmy poppy

- Mojave Indian paintbrush
- Mojave tarplant
- San Gabriel Mountains dudleya
- Many-stemmed dudleya
- Mesa horkelia
- California satintail
- California black walnut
- Ocellated lily
- Peirson's lupine
- Hall's monardella
- Gairdner's yampah
- Southern jewel flower
- Lemmon's syntrichopappus

Unlikely

- Kusche's sandwort
- San Gabriel manzanita
- Big Bear Valley milk-vetch
- San Gabriel River dudleya
- Fragrant pitcher sage
- Rock monardella
- Baja navarretia
- Rock Creek broomrape
- Southern mountains skullcap
- Parish's checkerbloom
- Laguna Mountains jewel flower

The remaining species that could occur within the ANF, as listed in Table 5, are expected to be absent from the Alternative 1 Project area due to lack of suitable habitat. In terms of impacts to biological plant resources, the only difference between the Alternatives is that a significantly smaller number of populations and individuals of slender mariposa lily and an intermediate number of beavertail cactus would be located within Alternative 1 (28 lilies, 49 cactus) than either Alternatives 2 and 2a (4,801 lilies, 84 cactus) or Alternative 3 (420 lilies, 5 cactus). It is therefore expected that impacts to slender mariposa lilies on Alternative 1 would be less than for Alternatives 2 and 2a or Alternative 3. Impacts to short-joint beavertail may be greater on Alternative 1 than on Alternative 3 but are expected to be less than on Alternatives 2 and 2a.

Direct impacts that could occur include habitat loss or loss of individual plants. Project construction may remove habitat that is suitable to support one or more of these species. Additionally, individual plants may be removed during excavation or ground-disturbing activities, or lost due to foot or vehicular traffic. Because many sections of the access roads along Alternative 1, particularly the Old Ridge Route, are not wide enough to accommodate construction equipment, widening the drivable width of the roads may remove suitable habitat for one or more of these species and/or remove individuals that go undetected during preconstruction botany surveys. Clearing and grading associated with the placement of towers or the grading of new access or spur roads may also result in the alteration of soil conditions, including changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions.

Many of the potential indirect effects can be categorized as habitat degradation, which could occur through proliferation of non-native plant species (discussed below under separate title), spread of dust onto vegetation within or adjacent to work areas, and soil compaction, all of which may affect the ability of native plants to survive or occur within affected areas. Construction can also result in the generation of dust due to ground disturbance, excavation, or even vehicular traffic. Dust that settles onto adjacent vegetation may reduce a plant's vigor by affecting its photosynthetic effectiveness. Trampling due to foot or vehicular traffic could result in soil compaction if it occurs repeatedly within any specific area; soil compaction may in turn lead to reduced water absorption and increased runoff, potentially contributing to an increase in non-native plant species, which could be more tolerant of these conditions. The Old Ridge Route is paved and soil compaction would be mostly limited to spur roads, tower sites, or areas where the paved access road may not be wide enough even with vegetation removal from within the road. Edison Spring Road, however, is a dirt road that will undergo soil compaction along its length and will be at greater risk of runoff or sedimentation.

Although Forest Service Sensitive plants were only detected in a few areas of Alternative 1, there is a potential for some species to occur in areas that have not been subject to intense focused surveys or may have failed to germinate even though the rain year was considered adequate to detect annual plants. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas would be marked and avoided to the maximum extent possible. However, it is possible that some Forest Service Sensitive plants would be subject to Project disturbance.

While not all the rare plants identified in the Project area would be subject to construction-related disturbance, it is likely that there would be a loss or mortality of some rare plants. Some of these species are more common in the region, and may therefore be less susceptible to loss on a forest-wide level. However, other species, such as Ross' pitcher sage and San Gabriel bedstraw, are of a more limited distribution and may be more susceptible to regional loss. However, as described above, impacts to many of the plant species identified in the Project area could be avoided or reduced if Project minimization measures are implemented.

When impacts to Forest Service Sensitive plant species are unavoidable, the Project mitigation measures require that impacts shall be compensated through reseeding (with locally collected seed stock), or other Forest Service or BLM approved methods. If Project activities result in a significant loss of the known individuals within a Forest Service Sensitive species occurrence to be impacted, and reseeding/transplanting is found to be unfeasible, LADWP shall restore ANF lands with a potential to harbor the impacted species at an appropriate mitigation ratio or preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).

LADWP has indicated that GPs, described in Table 1, would be implemented as part of the proposed Project to avoid or minimize impacts to biological resources including rare plant species. These GPs include avoiding or compensating for impacts to unique vegetation communities, training personnel, restricting work to within predetermined limits of construction, implementing erosion Best Management Practices (BMPs), construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes. As proposed, the GPs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, and do not specify what elements would be included in a Revegetation Plan. Because the GPs are not considered to be adequate protection for rare plants, the following mitigation measures are presented to further reduce impacts of the proposed Project on sensitive plants: Mitigation Measures AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat).

Mitigation Measures for Impacts to Sensitive Plant Species

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-13 Protect special-status plant species and their habitat. This mitigation measure would require LADWP to conduct pre-construction surveys for special-status plant species in the Project vicinity; to flag and avoid all identified individuals; and to restore/compensate for all special-status plants impacted by Project construction. (Refer to Table 2 for the full text of this mitigation measure)

Invasive Plant and Herbicide Use Impacts

The potential introduction or spread of noxious and invasive weeds would occur primarily during construction activities, but would also continue to occur during operation and maintenance phases of the Project. The introduction of noxious and invasive weeds would be related to ground disturbance from clearing and grading, expansion of access roads, construction of spur roads, and road maintenance; the use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed; use of straw bales or wattles that contain seeds of non-native plant species; and enhanced public access to the Project corridor during and after construction. Additionally, weed seeds are often spread on equipment or clothing by construction or maintenance personnel. This would provide many avenues for new propagules (any part of a plant that may generate a new individual plant) to be carried into areas that previously were isolated from sources of noxious weed seeds.

In areas where few exotic species occur, typically the characteristics of the existing topsoil structure, cryptogamic crusts, or the existing native vegetation prevent weed seeds from germinating. Once soil disturbance has occurred, the soil structure or native biotic components are affected such that these factors no longer preclude the establishment of noxious or invasive weeds. Following establishment, new populations of weeds are often extremely difficult to eradicate. It may take several years or decades to re-establish the native soil structure and biota. As many noxious weeds occurring in Southern California are fast-growing plants adapted to high light conditions, removal of canopy vegetation, either in woodlands or in chaparral and scrub habitats, may release weed seeds present in the seed bank from dormancy and allow them to germinate and establish. The spread of invasive plant species could also increase from unauthorized vehicle use. In addition, some roads and potentially drivable terrain that were previously obstructed by vegetation may now be more visible, making them subject to unauthorized off-road vehicle use. Access to these areas threatens the recruitment of native vegetation and promotes the spread of non-native and invasive species. In some cases, the loss of native plant communities could be permanent. This is especially true of climax plant communities that take decades or more to develop, such as pinyon-juniper woodland and Mojave scrub. These areas are at risk of type conversion, especially if non-native and invasive weeds become established.

Direct impacts associated with the introduction of noxious weeds could occur when noxious weeds become established in an area. These invasive plant species can cause a permanent or long-lasting change to the environment by increasing vegetative cover, creating a dense layer that prevents native vegetation from germinating, altering the edaphic and hydrological conditions through nitrogen fixation (as in Spanish broom), or draining the water table (as in giant reed). Noxious weeds can create such an unfavorable environment for wildlife that associate, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, are lost from the area.

Indirect impacts attributed to the colonization of noxious weeds could include a gradual decrease in natural biodiversity as noxious weed infestations may extirpate native plant populations. The lingering effects of herbicide use to remedy noxious weed infestations could adversely impact native plants and wildlife and are discussed in further detail below (Table 7). Ongoing operational and maintenance impacts could include the facilitation of noxious weed establishment and spread as a result of increased vehicular and human traffic.

To reduce Project impacts from the spread or establishment of noxious weeds, LADWP shall implement Mitigation Measures BIO-1 (Provide restoration/ compensation for impacts to native vegetation communities) and BIO-2 (Prepare and implement a Weed Control Plan; Remove weed seed sources from construction routes; and Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads). These mitigation measures would minimize the potential spread of noxious weeds as required by Forest Service Manual 2080.

As part of a comprehensive Weed Control Program (BIO-2), several options may be utilized to limit or reduce impacts from invasive plants. To date, several methods exist and are regularly prescribed for the eradication of existing weed populations depending on their location and the habitat type they infest. Some of these include herbicide application, mechanical removal, biocontrol methods, prescribed burns or floods, and shading. The removal of established noxious weed populations is best accomplished by species-specific methodologies, which may include a combination of the above removal procedures or precise timing of specific actions. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a differing follow-up treatment method after the initial removal occurs.

Noxious weed control measures prescribed as mitigation for Project impacts should be species-specific, and herbicides should be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for that weed species. While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and ingestion of contaminated media, including vegetation, prey species, and water. However with the measures prescribed as mitigation, the potential for impacts to aquatic fauna would be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Offsite drift typically depends on the droplet size and meteorological conditions. Other offsite exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion.

Table 7 contains a list of herbicides, including their potential risks to native vegetation and wildlife, that are proposed for use within the Project area on Forest Service lands. It is important to note that there is an extensive variability related to different types of exposure scenarios and dosages for each herbicide. Furthermore, the effects of certain herbicides can vary exclusively at the species level. Therefore, the information presented in Table 7 is intended as a general overview of the possible effects of herbicide use. Full analyses on the effects of these ten listed herbicides on human and ecological health can be found in the Forest Service Risk Assessment Final Reports (http://www.fs.fed.us/foresthealth/pesticide/risk.shtml) and is incorporated by reference.

TABLE 7. GENERAL EFFECTS OF HERBICIDES ON PLANT AND WILDLIFE SPECIES

Herbicide	Effects on Vegetation	Effects on Wildlife
Chlorsulfuron	• Rate and extent of uptake following foliar application varies by species • Inhibits an enzyme that is essential for plant growth	• Causes weight loss and decreased body weight gain in experimental mammals • Appears to have low toxicity in mammals, birds, fish, and invertebrates
Clopyralid	• Highly selective toxicity to terrestrial plants (primarily broadleaf species) • Relatively non-toxic to aquatic plants and grasses • Regulates plant growth by acting as a synthetic auxin, thus altering plant's metabolism and growth characteristics	• Appears to be relatively non-toxic to terrestrial or aquatic wildlife • May adversely affect liver and kidney weights and gastric epithelial tissue • Appears to show no effect on viability of bird eggs and chick immune systems
Dicamba	• Mimics plant hormone indole-3 acetic acid • Mechanism appears to involve a stimulation of ethylene production leading to accumulation of abscisic acid and/or cyanide resulting in abnormal growth	• Displays an apparent pattern of interspecies scaling, with smaller animals being less sensitive than larger animals • Relatively non-toxic to mammals, fish, and amphibians • Acute toxicity to birds appears to be generally low • May reduce growth and stunt eye development in pre- and post-hatch birds
Glyphosate	• Inhibits shikimic acid pathway, effectively blocking synthesis of certain phenolic compounds and aromatic amino acids • Inhibits photosynthesis, respiration, and nucleic acid synthesis	• May reduce food conversion efficiency leading to loss of body weight in mammals and birds • Certain surfactants used with glyphosate are much more toxic to fish that others • May cause histological changes in gills, kidneys, and liver of some fish
Hexazinone	• Inhibits photosynthesis by diverting highly reactive molecules into a chain reaction that destroys chloroplast, cell membranes, and other vital compounds that eventually leads to cell death and ultimately plant destruction • Can be used as a pre or post emergent herbicide	• Relatively low toxicity to birds and mammals. • Slightly toxic to most aquatic animals, including fish, but can be highly toxic to algae and aquatic macrophytes • Potential to build up in soil and plant matter and move through food chain if used at very high rates
Imazapyr	• Inhibits an enzyme that is essential for plant growth • Practically non-toxic to conifers	• Appears to be relatively non-toxic to terrestrial and aquatic animals
Sulfometuron methyl	• Blocks cell division in the active growing region of the stem and root tips • Can be used as a pre or post emergent	• Practically non-toxic to birds • Slightly toxic to fish, mostly in the hatch stage • Slightly toxic to mammals, but no birth defects or cancer

Herbicide	Effects on Vegetation	Effects on Wildlife
Triclopyr	• Mimics indole auxin plant growth hormones causing uncontrollable growth • At sufficiently high levels of exposure, abnormal growth is so severe that vital functions cannot be maintained and plants die	• May cause developmental effects at levels that cause maternal toxicity in mammals • May have adverse affect on mammalian kidney functions • Higher concentrations may cause mortality or immobility in frog tadpoles • Larger doses may cause a decrease in body length and smaller doses may lead to lethargic behavior in some fish • Relatively non-toxic to birds

Source: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

The use of herbicides in the Project area would comply with regulations set forth by the U.S. Environmental Protection Agency (EPA) and California Department of Pesticide Regulation (CDPR). Additionally, any herbicide use on NFS lands would be subjected to the review and approval of the appropriate Forest Service personnel. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect. To reduce the effects of herbicides, if used, LADWP would implement Mitigation Measure BIO-2 (Prepare and implement a weed control plan).

Impacts from Native Seed Collecting and Restoration Efforts

Restoration activities may inadvertently lead to negative effects on special-status plant species. For instance, seed collection from common native plants may result in the unintentional trampling of special-status species, should they be present in the area, or in the inadvertent removal or destruction of their seeds. Weed removal activities may lead to species being treated or removed that are not non-native. However, it is unlikely that special-status species would be present in areas of heavy non-native plant cover and may instead be present in areas of predominantly native or mixed native/non-native plant composition. In addition, weeding and seed collection efforts may lead to the unintentional transportation of non-native seed on clothing or weeding materials to areas occupied by special-status plants, potentially creating a new weed infestation. In order to minimize the negative impacts of these restoration activities, mitigation measures such as effective preconstruction flagging of sensitive species, required training for field personnel to be familiar with identifying non-native species and/or species that are to be avoided, and washing seeds off of all equipment prior to entering new areas would assist in reducing the likelihood of incidental effects during seed collection or weed removal.

Alternative 2 – Construction of the proposed new 230 kV transmission line on Alternative 2 could potentially directly affect the following Forest Service Sensitive botanical species that could occur within the transmission line corridor:

Present

- Slender mariposa lily
- Short-joint beavertail

Likely

- Palmer's mariposa lily
- Plummer's mariposa lily
- Alkali mariposa lily
- Parry's spineflower
- Mojave tarplant
- Many-stemmed dudleya
- San Gabriel bedstraw
- Ross' pitcher sage
- San Bernardino aster

Possible

- California androsace
- Kusche's sandwort
- Late-flowered mariposa lily
- San Gabriel Mountains dudleya
- Mesa horkelia
- California satintail
- California black walnut
- Ocellated lily
- Hall's monardella
- Rock Creek broomrape
- Parish's checkerbloom
- Laguna Mountains jewel flower
- Southern jewel flower
- Lemmon's syntrichopappus

Unlikely

- San Gabriel manzanita
- San Gabriel River dudleya
- Fragrant pitcher sage
- Rock monardella
- Baja navarretia
- Gairdner's yampah
- Southern mountains skullcap

The remaining species that could occur within the ANF, as listed in Table 5, are expected to be absent from the Alternative 2 Project area due to lack of suitable habitat. In terms of impacts to biological plant resources, the only difference between the Alternatives is that a significantly greater number of populations and individuals of both slender mariposa lily and beavertail cactus would be located within Alternatives 2 and 2a (4,801 lilies, 84 cactus) than both Alternatives 1 (28 lilies, 49 cactus) and 3 (420 lilies, 5 cactus). During surveys conducted in 2008 and 2010, no special-status plants were identified on Segment 2a, resulting in Alternatives 2 and 2a having the same number of identified special-status plants. However, surveys were only conducted along access roads adjacent to Alternative 2a, as the corridor was composed of dense chaparral. It is therefore expected that impacts to these sensitive species would be greater for Alternatives 2 and 2a than for Alternatives 1 and 3.

Direct impacts that could occur include habitat loss or loss of individual plants. Project construction may remove habitat that is suitable to support one or more of these species. Additionally, individual plants may be removed during excavation or ground-disturbing activities, or lost due to foot or vehicular traffic. Ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. In April 2009, LADWP conducted unauthorized road grading along approximately five miles of City Highline Motorway Fire Road, which provides access along much of Alternative 2. A byproduct of the grading was that the overall width of the road along this section was increased. While areas used for access within this five-mile portion of the road are not expected to require any road widening for construction access, access and spur roads outside of this area may require widening. This will potentially remove habitat that is suitable for one or more of these species or remove individuals that are undetected during preconstruction surveys. Clearing and grading associated with the placement of towers or the grading of new access or spur roads may also result in the alteration of soil conditions, including changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions.

Many of the potential indirect effects can be categorized as habitat degradation, which could occur through proliferation of non-native plant species, spread of dust onto vegetation within or adjacent to work areas, and soil compaction, all of which may affect the ability of native plants to survive or occur within affected areas. Construction can also result in the generation of dust due to ground disturbance, excavation, or even vehicular traffic. Dust that settles onto adjacent vegetation may reduce a plant's vigor by affecting its photosynthetic effectiveness. Trampling due to foot or vehicular traffic could result in soil compaction if it occurs repeatedly within any specific area; soil compaction may in turn lead to reduced water absorption and increased runoff, potentially contributing to an increase in non-native plant species, which could be more tolerant of these conditions.

Although Forest Service Sensitive plants were only detected in a few areas of Alternative 2, there is a potential for some species to occur in areas that have not been subject to intense focused surveys or may have failed to germinate even though the rain year was considered adequate to detect annual plants. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas would be marked and avoided to the maximum extent possible. However, it is possible that some Forest Service Sensitive plants would be subject to Project disturbance.

While not all the rare plants identified in the Project area would be subject to construction-related disturbance, it is likely that there would be a loss or mortality of some rare plants. Some of these species are more common in the region, and may therefore be less susceptible to loss on a forest-wide level. However, other species, such as Ross's pitcher sage and San Gabriel bedstraw, are of a more limited distribution and may be more susceptible to regional loss. However, as described above, impacts to many of the plant species identified in the Project area could be avoided or reduced if Project minimization measures are implemented.

When impacts to Forest Service Sensitive plant species are unavoidable, the Project mitigation measures require that impacts shall be compensated through reseeding (with locally collected seed stock), or other Forest Service or BLM approved methods. If Project activities result in a significant loss of the known individuals within a Forest Service Sensitive species occurrence to be impacted, and reseeding/transplanting is found to be unfeasible, LADWP shall restore ANF lands with a potential to harbor the impacted species at an appropriate mitigation ratio or preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).

A temporary alternative transmission line would be required for construction of Alternative 2 around the vicinity of the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded to a three-circuit lattice tower. This temporary transmission line would be 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in the unincorporated community of Elizabeth Lake, and would constitute 4.18 acres of temporary disturbance. The proposed corridor is almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Where the temporary transmission line would leave the road, overall habitat quality is estimated to be low; however, no botanical surveys have occurred along this proposed corridor. Some habitat is present to support southwestern willow flycatcher, arroyo toad, California red-legged frog, least Bell's vireo, and unarmored threespine stickleback, but there are no known special-status wildlife occurrences or wildlife corridors in this area. This portion partially falls within the San Andreas Rift Zone Significant Ecological Area (SEA) and the Santa Clara River SEA. It is estimated that 81 trees would require trimming or removal along this route within 28 distinct sections of road. These mostly consist of *Quercus* or *Pinus* species. Twenty-seven of these trees are within NFS boundaries.

Direct impacts to special-status plant species may occur in a variety of ways, including the direct removal of plants during the course of construction. Clearing and grading associated with the placement of temporary towers or the grading of access or spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Indirect impacts include the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation and may adversely affect wildlife. Dust from road travel, grading, or other construction activities may also reduce photosynthetic capacity in plants over time or inhibit reproduction by physically coating reproductive structures or excluding insect pollinators.

LADWP has indicated that GPs, described in Table 1, would be implemented as part of the proposed Project to avoid or minimize impacts to biological resources including rare plant species. These GPs include avoiding or compensating for impacts to unique vegetation communities, training personnel, restricting work to within predetermined limits of construction, implementing erosion BMPs, construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes. As proposed, the GPs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, and do not specify what elements would be included in a Revegetation Plan. Because the GPs are not considered to be adequate protection for rare plants, the following mitigation measures are presented to further reduce impacts of the proposed Project on sensitive plants: Mitigation Measures AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat) below. See Alternative 1 for a summary of the text of these mitigation measures.

Invasive Plant and Herbicide Use Impacts

See Alternative 1 for a discussion of invasive plant and herbicide use impacts within the Project area.

Impacts from Native Seed Collecting and Restoration Efforts

See Alternative 1 for a discussion of potential impacts from native seed collecting and restoration efforts.

Alternative 2a – Construction of the proposed new 230 kV transmission line on Alternative 2a could potentially directly affect the following Forest Service Sensitive and federally listed botanical species that could occur within the transmission line corridor. Because Alternative 2a is composed of Segments G and 2a within the ANF, most species' potentials for occurrence are identical along both segments, which mostly parallel each other. Where one species has a different potential to occur on either segment, it is reflected in both categories below with a note for which segment is being referenced.

Present

- Slender mariposa lily (Segment G)
- Short-joint beavertail (Segment G)

Likely

- Slender mariposa lily (Segment 2a)
- Palmer's mariposa lily (Segment G)
- Plummer's mariposa lily (Segment G)
- Alkali mariposa lily

- Parry's spineflower
- Mojave tarplant (Segment G)
- Many-stemmed dudleya (Segment G)
- San Gabriel bedstraw
- Ross' pitcher sage
- Short-joint beavertail (Segment 2a)
- San Bernardino aster (Segment G)

Possible

- California androsace
- Kusche's sandwort
- Palmer's mariposa lily (Segment 2a)
- Plummer's mariposa lily (Segment 2a)
- Late-flowered mariposa lily
- Mojave tarplant (Segment 2a)
- San Gabriel Mountains dudleya (Segment G)
- Many-stemmed dudleya (Segment 2a)
- Urn-flowered alumroot (Segment 2a)
- Mesa horkelia
- California satintail (Segment G)
- California black walnut
- Fragrant pitcher sage (Segment 2a)
- Ocellated lily
- Hall's monardella
- Rock Creek broomrape
- Parish's checkerbloom
- Laguna Mountains jewel flower
- Southern jewel flower
- San Bernardino aster (Segment 2a)
- Lemmon's syntrichopappus

Unlikely

- San Gabriel manzanita
- San Gabriel River dudleya
- San Gabriel Mountains dudleya (Segment 2a)
- California satintail (Segment 2a)
- Fragrant pitcher sage (Segment G)
- Rock monardella
- Baja navarretia
- Gairdner's yampah
- Southern mountains skullcap

The remaining species that could occur within the ANF, as listed in Table 5, are expected to be absent from the Alternative 2a Project area due to absence of suitable habitat. In terms of impacts to biological plant resources, the only difference between the Alternatives is that a significantly greater number of populations and individuals of both slender mariposa lily and beavertail cactus would be located within Alternatives 2 and 2a (4,801 lilies, 84 cactus) than both Alternatives 1 (28 lilies, 49 cactus) and 3 (420 lilies, 5 cactus). During surveys conducted in 2008 and 2010, no special-status plants were identified on Segment 2a, resulting in Alternatives 2 and 2a having the same number of identified special-status plants.

It is therefore expected that impacts to these sensitive species would be greater for Alternatives 2 and 2a than for Alternatives 1 and 3.

See botanical analysis for Alternative 2.

Alternative 3 – Construction of the proposed new 230 kV transmission line on Alternative 3 could potentially directly affect the following Forest Service Sensitive and federally listed botanical species that could occur within the transmission line corridor:

Present

- Slender mariposa lily
- Short-joint beavertail

Likely

- Plummer's mariposa lily
- Alkali mariposa lily
- Parry's spineflower
- San Gabriel bedstraw
- Ross' pitcher sage

Possible

- California androsace
- Kusche's sandwort
- Palmer's mariposa lily
- Late-flowered mariposa lily
- White pygmy poppy
- Mojave Indian paintbrush
- Mojave tarplant
- San Gabriel Mountains dudleya
- Many-stemmed dudleya
- Urn-flowered alumroot
- Mesa horkelia
- California satintail
- California black walnut
- Fragrant pitcher sage
- Ocellated lily
- Hall's monardella
- Baja navarretia
- Rock Creek broomrape
- Gairdner's yampah
- Parish's checkerbloom
- Laguna Mountains jewel flower
- Southern jewel flower
- San Bernardino aster
- Lemmon's syntrichopappus

Unlikely

- San Gabriel manzanita
- San Gabriel River dudleya
- Rock monardella

- Southern mountains skullcap

The remaining species that could occur within the ANF, as listed in Table 5, are expected to be absent from the Alternative 3 Project area due to lack of suitable habitat. In terms of impacts to biological plant resources, the only difference between the Alternatives is that an intermediate number of populations and individuals of slender mariposa lily and a smaller number of beavertail cactus would be located within Alternative 3 (420 lilies, 5 cactus) when compared to Alternative 1 (28 lilies, 49 cactus) and Alternatives 2 and 2a (4,801 lilies, 84 cactus). It is therefore expected that impacts to slender mariposa lily would potentially be greater for Alternatives 2 and 2a than for Alternative 3, but less for Alternative 1. Impacts to short-joint beavertail are expected to be less for Alternative 3 than for all other Alternatives.

Direct impacts that could occur include habitat loss or loss of individual plants. Project construction may remove habitat that is suitable to support one or more of these species. Additionally, individual plants may be removed during excavation or ground-disturbing activities, or lost due to foot or vehicular traffic. Ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. Clearing and grading associated with the placement of towers or the grading of new access or spur roads may also result in the alteration of soil conditions, including changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions.

Many of the potential indirect effects can be categorized as habitat degradation, which could occur through proliferation of non-native plant species, spread of dust onto vegetation within or adjacent to work areas, and soil compaction, all of which may affect the ability of native plants to survive or occur within affected areas. Because of this ease of transportation, roadsides are often easy for invasive plants to spread into, which also increases the likelihood of seeds becoming attached to passing vehicles and being transported elsewhere. Construction can also result in the generation of dust due to ground disturbance, excavation, or even vehicular traffic. Dust that settles onto adjacent vegetation may reduce a plant's vigor by affecting its photosynthetic effectiveness. Trampling due to foot or vehicular traffic could result in soil compaction if it occurs repeatedly within any specific area; soil compaction may in turn lead to reduced water absorption and increased runoff, potentially contributing to an increase in non-native plant species, which could be more tolerant of these conditions.

Although Forest Service Sensitive plants were only detected in a few areas of Alternative 3, there is a potential for some species to occur in areas that have not been subject to intense focused surveys or may have failed to germinate even though the rain year was considered adequate to detect annual plants. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas would be marked and avoided to the maximum extent possible. However, it is possible that some Forest Service Sensitive plants would be subject to Project disturbance.

While not all the rare plants identified in the Project area would be subject to construction-related disturbance, it is likely that there would be a loss or mortality of some rare plants. Some of these species are more common in the region, and may therefore be less susceptible to loss on a forest-wide level. However, other species, such as Ross's pitcher sage and San Gabriel bedstraw, are of a more limited distribution and may be more susceptible to regional loss. However, as described above, impacts to many of the plant species identified in the Project area could be avoided or reduced if Project minimization measures are implemented.

When impacts to Forest Service Sensitive plant species are unavoidable, the Project mitigation measures require that impacts shall be compensated through reseeding (with locally collected seed stock), or other Forest Service or BLM approved methods. If Project activities result in a significant loss of the known individuals within a Forest Service Sensitive species occurrence to be impacted, and reseeding/transplanting is found to be unfeasible, LADWP shall restore ANF lands with a potential to harbor the impacted species at an appropriate mitigation ratio or preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).

LADWP has indicated that GPs, described in Table 1, would be implemented as part of the proposed Project to avoid or minimize impacts to biological resources including rare plant species. These GPs include avoiding or compensating for impacts to unique vegetation communities, training personnel, restricting work to within predetermined limits of construction, implementing erosion BMPs, construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes. As proposed, the GPs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, and do not specify what elements would be included in a Revegetation Plan. Because the GPs are not considered to be adequate protection for rare plants, the following mitigation measures are presented to further reduce impacts of the proposed Project on sensitive plants: Mitigation Measures AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat) below.

Invasive Plant and Herbicide Use Impacts

See Alternative 1 for a discussion of invasive plant and herbicide use impacts within the Project area.

Impacts from Native Seed Collecting and Restoration Efforts

See Alternative 1 for a discussion of potential impacts from native seed collecting and restoration efforts.

Reconductoring

The proposed upgrade of the existing BR-RIN would involve approximately 13 miles of NFS lands and four miles of BLM-managed public lands. The reconductoring component would occur regardless of which Project alternative is ultimately chosen for construction, and thus any effects to sensitive plant species that could occur as a result of this component would remain. Reconductoring would occur along Segment G within the ANF. Because the existing transmission line closely parallels the Alternative 2 new transmission line corridor, the potential for species to occur is the same between the existing line and Alternative 2. As such, the impacts to each are expected to be approximately the same, although the reconductoring area may have less ground disturbance because the transmission line and towers are already in place. Alternative 2 is expected to potentially have a greater impact on the southern coast live oak riparian forest community than the existing transmission line due to areas where the two corridors diverge from each other.

New 230 kV Circuit

Addition of the proposed new 230 kV circuit on the existing transmission line to Castaic Power Plant would occur regardless of which alternative is ultimately chosen for construction. This component could potentially directly affect the following Forest Service Sensitive and federally listed botanical species that could occur within the transmission line corridor:

Present

- Slender mariposa lily

- Short-joint beavertail

Likely
- Plummer's mariposa lily
- Parry's spineflower
- San Gabriel bedstraw
- Ross' pitcher sage

Possible
- California androsace
- Alkali mariposa lily
- Late-flowered mariposa lily
- Mojave tarplant
- San Gabriel Mountains dudleya
- Many-stemmed dudleya
- Mesa horkelia
- California satintail
- California black walnut
- Ocellated lily
- Hall's monardella
- Gairdner's yampah
- Lemmon's syntrichopappus

Unlikely
- Kusche's sandwort
- San Gabriel manzanita
- Palmer's mariposa lily
- San Gabriel River dudleya
- Fragrant pitcher sage
- Rock monardella
- Baja navarretia
- Rock Creek broomrape
- Southern mountains skullcap
- Parish's checkerbloom
- Laguna Mountains jewel flower

The remaining species that could occur within the ANF, as listed in Table 5, are expected to be absent from the new 230 kV circuit Project area due to lack of suitable habitat.

During the 2010 botanical surveys, only two Forest Service Sensitive or listed species were observed along the proposed new 230 kV circuit Project component. This included 13 slender mariposa lilies and nine short-joint beavertails. Other species may have gone unnoticed or there may be additional plants that have established by the time construction begins. Preconstruction surveys should locate most of these plants so that they can be avoided, but in the event that a plant goes unseen, or if construction occurs during a time when plants are not flowering and are not distinguishable, destruction of the plant by grading or excavation is a possibility. Direct effects are expected to be relatively limited because the transmission line and access roads are already in place. However, the degree of direct disturbance to plants will be determined by the condition of access roads, whether it is necessary to replace any towers or supports which may not be able to accommodate the extra conductor, and the placement of potentially large staging areas and pull sites.

Potential direct effects include vegetation loss and partial or complete destruction of special-status plant species that may be present within the ROW. Special-status plants were surveyed for during 2008, 2009 and 2010 botanical surveys; not all special-status plants may have been documented. Trampling by ground crews would likely not kill any plants, but may partially destroy their above-ground biomass. Indirect effects include spread of non-native plant species, increased dust deposition, and soil compaction. Non-native weed seeds may attach to vehicle tires, undercarriages, or elsewhere and can be quickly and easily transported between work areas, where they may fall onto disturbed ground and potentially out-compete native species if they become established. Because of this ease of transportation, roadsides are often easy for invasive plants to spread into, which also increases the likelihood of seeds becoming attached to passing vehicles and being transported elsewhere. Construction can also result in the generation of dust due to ground disturbance, excavation, or even vehicular traffic. Dust that settles onto adjacent vegetation may reduce a plant's vigor by affecting its photosynthetic effectiveness. Trampling due to foot or vehicular traffic could result in soil compaction if it occurs repeatedly within any specific area; soil compaction may in turn lead to reduced water absorption and increased runoff, potentially contributing to an increase in non-native plant species, which could be more tolerant of these conditions.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines and switching stations would occur regardless of which alternative is ultimately chosen for construction and would pose a threat to botanical species. Temporary increased ground disturbance may also have impacts on the seed bank, reducing the amount of native seeds or increasing the amount of non-native seeds if soil is carried between sites by vehicle tires or carriages. These impacts could be at times localized and temporary and at other times more widespread and permanent. Additionally, individual plants may be removed during ground-disturbing activities or lost due to foot or vehicle traffic.

Invasive Plant and Herbicide Application Impacts

The potential introduction or spread of noxious and invasive weeds would occur primarily during construction activities, but would also continue to occur during operation and maintenance phases of the Project. The introduction of weeds would be related to ground disturbance; for operation and maintenance activities, this would relate mostly to future clearing and grading of vegetation and future reestablishment of existing access/spur roads where applicable. Because all towers would have established access/spur roads during construction, there is unlikely a need for entirely new roads to any of the towers in the Project area unless there is a washout or other event that makes the road(s) completely unusable. Weeds would then spread along these roads or in the work areas, most likely from heavy equipment, pickup trucks, or foot crews.

Because operations and maintenance activities would likely be individual sites or a small area, the likelihood of spreading weeds into an area from outside of that area is relatively low. In most cases, the only ground disturbance would be at the site, so it is assumed that no new weeds would be introduced. Most operation and maintenance activities go through individual approval processes and are required to be authorized by the USFS individually, during which it is typical to require equipment washing prior to entering NFS lands or at pre-designated locations. Therefore, the linear spread of weeds due to operations and maintenance activities is of low likelihood compared to the chance for weeds to spread at individual small construction sites. Where operations and maintenance affect a larger area, particularly a linear area, the threat of weeds spreading is larger.

See Alternative 1 for a discussion of the subsequent environmental effects of invasive plant establishment, as well as a discussion and comparison (Table 7) of herbicides that may be used to reduce the spread and growth of weeds and their potential effects on plants and wildlife. Although operations and maintenance projects typically have their own individual mitigation measures and restoration plans, it is likely that activities related to the BRRTP and its associated structures would still elect to use the approved BRRTP herbicides for weed control. The use of herbicides in the Project area would comply with regulations set forth by the EPA and CDPR. Additionally, any herbicide use on NFS lands would be subjected to the review and approval of the appropriate Forest Service personnel.

Impacts from Native Seed Collecting and Restoration Efforts

Following construction, all disturbed areas will be restored according to the methods described in the Habitat Restoration Plan and Mitigation Measures BIO-1 (Provide restoration/compensation for impacts to native vegetation communities) and BIO-2 (Prepare and implement a Weed Control Plan; Remove weed seed sources from construction routes; and Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads). However, operation and maintenance activities may reintroduce weed species or result in bare ground in areas that had previously been cleared and restored. Operations and maintenance impacts are most likely to be future clearing and grading of vegetation and future reestablishment of existing access/spur roads where applicable. Because most operation and maintenance activities go through individual approval processes and are required to be authorized by the Forest Service, future operations and maintenance activities would likely have their own restoration plans that are specific to the required construction. This may involve native seed collecting on or near the site or may involve purchasing pre-collected seed from elsewhere for plants that are not overly abundant in the Project area. Regardless of whether seeds are collected on-site or off-site, any restoration is likely to mirror the same basic vegetation composition that was already present or was prescribed for initial BRRTP construction.

Summary

Of the special-status plants that could occur within the ANF, only two are known to be within the Project corridors: slender mariposa lily and short-joint beavertail; however, protocol-level surveys were not conducted over a significant portion of the Project corridors, due to a lack of Project engineering design, vegetation density and steep terrain. Therefore, the potential exists for numerous other special-status plant species and populations to reside within the Project disturbance boundaries. Consequently, Project construction is expected to result in habitat loss and degradation for all species with potential to occur, although direct mortality or effects to individual plants would be dependent on their presence within work areas and their successful avoidance due to preconstruction surveys and flagging.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, special-status botanical species.

Alternative 2: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, special-status botanical species.

Alternative 2a: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, special-status botanical species.

Alternative 3: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, special-status botanical species.

4.1.2 Animals

Swainson's Hawk, Peregrine Falcon, and Bald Eagle

New 230 kV Transmission Line

Alternative 1 – There may be direct or indirect effects to Swainson's hawk, peregrine falcon, and bald eagle. Swainson's hawk is expected to have a possibility to occur based on availability of suitable grassland and shrub habitat in the Alternative's northern end. Peregrine falcons are expected to have a possibility of occurring on this alternative due to the abundant open water around Quail Lake, Pyramid Lake, Castaic Lake, and Castaic Lagoon. There are also nesting opportunities for falcons with the buildings and structures around the Castaic Lake/Lagoon region. Bald eagles are expected to have a possibility of occurring on this segment due to the abundant open water around Quail Lake, Pyramid Lake, Castaic Lake, and Castaic Lagoon. Construction of new towers and grading of new or existing access roads would result in vegetation and habitat loss to these species; however, the restoration plan would require restoration and/or compensation for habitats impacted by this Project. Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the Swainson's hawk and peregrine falcon's potential habitat. Figure 7, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction.

Direct injury or mortality from construction is not expected based on the lack of recorded sightings of these species. Should any of them nest near the proposed ROW, they may be displaced by construction disturbance depending on the amount of ambient disturbance in the area, which is greater around Neenach and Castaic Lake/Lagoon; however, with implementation of the mitigation measure to protect raptors and migratory birds, this impact would be minimized. If displacement occurs, adults and/or their young would likely need to relocate, which could possibly result in indirect injury or mortality as they move to inhabit new locations. Power line design could result in injury or mortality to raptors that are flying through the area or even perching on the towers, and appropriate tower design and protective measures will need to be enforced to prevent this. Birds, particularly raptors, are also known to perch, roost, or even nest on transmission structures, and may collide with power lines upon landing in or leaving a water body (APLIC 2006). However, this transmission line would be directly adjacent to several other transmission lines, so it is unlikely that the addition of this transmission line would result in a substantial increase in risk to this species from colliding with transmission lines along this alignment.

General practices that would reduce short-term or long-term effects to Swainson's hawk, peregrine falcon, and bald eagle include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-18 (Protect the bald eagle and golden eagle).

Mitigation Measures for Impacts to Swainson's Hawk, Peregrine Falcon, and Bald Eagle

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the

Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, Forest Service, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-11 Reduce avian collisions with and electrocutions on transmission lines. This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 2 for the full text of this mitigation measure)

BIO-17 Protect the bald eagle and golden eagle. This mitigation measure would require LADWP to conduct pre-construction surveys for bald or golden eagles within suitable habitat in the Project vicinity if construction is to occur during their breeding seasons; to enforce construction exclusion buffers for ground personnel and helicopters as applicable; and to halt construction if a bald or golden eagle is observed near construction. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – On Segment G, there may be direct or indirect effects to Swainson's hawk or peregrine falcon, both expected to have a possibility of occurring on this segment due to available water sources in San Francisquito Creek and Drinkwater Reservoir (when full) and available nesting habitat on the ledges and boulders along the western edge of San Francisquito Canyon. Swainson's hawks were also identified by POWER biologists above Segment G in 2009, but these were deemed to be most likely migrants. There are also nesting opportunities for falcons with the buildings and structures throughout San Francisquito Canyon, such as power plants, residences, and existing transmission lines. Bald eagle is expected to be absent on this alternative. Construction of new towers and grading of new or existing access roads would result in vegetation and habitat loss to this species; however, the restoration plan would require restoration and/or compensation for habitats impacted by this Project. Direct injury or mortality from construction is not expected based on the lack of recorded sightings, but should any individuals nest near the proposed ROW, they may be displaced by construction disturbance depending on the amount of ambient disturbance in the area, which is greater in the central Green Valley portion of the segment than either the northern (Antelope Valley) and southern (Dry Canyon) portions. If this is the case, adults and/or their young would likely need to relocate, which could possibly result in indirect injury or mortality as they move to inhabit new locations, but implementation of the mitigation measure to protect nesting raptors and migratory birds should minimize this impact by identifying active nests and avoiding construction activities that may negatively impact those nests. Power line design could result in injury or mortality to raptors that are flying through the area or even perching on the towers, and appropriate tower design and protective measures will need to be enforced to prevent this. Birds, particularly raptors, are also known to perch, roost, or even nest on transmission structures, and may collide with power lines upon landing in or leaving a water body (APLIC 2006). However, this transmission line would be directly adjacent to several other transmission lines, so it is unlikely that the addition of this transmission line would result in a substantial increase in risk to this species from colliding with transmission lines along this alignment.

General practices that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-11 (Reduce avian collisions with and electrocutions on transmission lines).

Alternative 2a – On Segment G, there may be direct or indirect effects to Swainson's hawk or peregrine falcon, both expected to have a possibility of occurring on this segment due to available water sources in San Francisquito Creek and Drinkwater Reservoir (when full) and available nesting habitat on the ledges and boulders along the western edge of San Francisquito Canyon. Swainson's hawks were also identified by POWER biologists above Segment G in 2009, but these were deemed to be most likely migrants. There are also nesting opportunities for falcons with the buildings and structures throughout San Francisquito Canyon, such as power plants, residences, and existing transmission lines. Bald eagle is expected to be absent on this alternative. Construction of new towers and grading of new or existing access roads would result in vegetation and habitat loss to this species; however, the restoration plan would require restoration and/or compensation for habitats impacted by this Project. Direct injury or mortality from construction is not expected based on the lack of recorded sightings, but should any individuals nest near the proposed ROW, they may be displaced by construction disturbance depending on the amount of ambient disturbance in the area, which is greater in the central portion of the alternative near the mouth of South Portal Canyon and around Green Valley than either the northern (Antelope Valley) and southern (Dry Canyon) portions. If this is the case, adults and/or their young would likely need to relocate, which could possibly result in indirect injury or mortality as they move to inhabit new locations, but implementation of the mitigation measure to protect nesting raptors and migratory birds should minimize this impact by identifying active nests and avoiding construction activities that may negatively impact those nests. Power line design could result in injury or mortality to raptors that are flying through the area or even perching on the towers, and appropriate tower design and protective measures will need to be enforced to prevent this. Birds, particularly raptors, are also known to perch, roost, or even nest on transmission structures, and may collide with power lines upon landing in or leaving a water body (APLIC 2006). However, this transmission line would be directly adjacent to several other transmission lines, so it is unlikely that the addition of this transmission line would result in a substantial increase in risk to this species from colliding with transmission lines along this alignment.

General practices that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-11 (Reduce avian collisions with and electrocutions on transmission lines).

Alternative 3 – Under Segment I, there may be direct or indirect effects to Swainson's hawk and peregrine falcon. Swainson's hawk is expected to have a possibility to occur based on the presence of poor-quality grassland in the upper end of the segment combined with nesting habitat on existing towers and some pockets of trees around residences, and presence of the California Aqueduct through the segment, while peregrine falcon is expected to be unlikely to occur based on the limited availability of nesting and aquatic habitat for this species. Bald eagle is expected to be absent on this alternative. Construction of new towers and grading of new or existing access roads would result in foraging habitat loss to this species; however, the restoration plan would require restoration and/or compensation for habitats impacted by this Project. Direct injury or mortality from construction is not expected based on the lack of recorded sightings, but should any hawks nest near the proposed ROW, they may be displaced by construction disturbance. If this is the case, adults and/or their young would likely need to relocate, which could possibly result in indirect injury or mortality as they move to inhabit new locations, but implementation of the mitigation measure to protect nesting raptors and migratory birds should minimize this impact by identifying active nests and avoiding construction activities that may negatively impact those nests. Power line design could result in injury or mortality to Swainson's hawks that are flying through the area or even perching on the towers, and appropriate tower design and protective measures will need to be enforced to prevent this. Birds, particularly raptors, are also known to perch, roost, or even nest on transmission structures (APLIC 2006). However, this transmission line would be directly adjacent to several other transmission lines, so it is unlikely that the addition of this transmission line would result in a substantial increase in risk to this species from colliding with transmission lines along this alignment.

General practices that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include GP-8, GP-38, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to Swainson's hawk and peregrine falcon include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-11 (Reduce avian collisions with and electrocutions on transmission lines).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G within the ANF is analyzed in detail above for the Swainson's hawk and peregrine falcon under Alternatives 2 and 2a. Bald eagle is not expected to occur on either of these alternatives. Potential risks to these species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Addition of the proposed new 230 kV circuit on the existing transmission line to Castaic Power Plant may result in direct or indirect effects to peregrine falcon or bald eagle. Both species are expected to have possibilities of occurring on this segment due to the abundant open water around Castaic Lake and Castaic Lagoon. There are also nesting opportunities for falcons with the buildings and structures around the Castaic Lake/Lagoon region. Grading of new or existing access roads would result in vegetation and habitat loss to this species; however, the restoration plan would require restoration and/or compensation for habitats impacted by this project. Direct injury or mortality from construction is not expected based on the lack of recorded sightings of this species. Should any individuals nest near the proposed ROW, they may be displaced by construction disturbance depending on the amount of ambient disturbance in the area, which is greater around Castaic Lake/Lagoon. If this is the case, adults and/or their young would likely need to relocate, which could possibly result in indirect injury or mortality as they move to inhabit new locations, but implementation of the mitigation measure to protect nesting raptors and migratory birds should minimize this impact by identifying active nests and avoiding construction activities that may negatively impact those nests. Addition of an additional circuit on the power line could result in injury or mortality to raptors that are flying through the area or even perching on the towers, and appropriate protective measures will need to be enforced to prevent this. Birds, particularly raptors, are known to perch, roost, or even nest on transmission structures, and may collide with power lines upon landing in or leaving a water body (APLIC 2006). However, this transmission line is pre-existing and is directly adjacent to another transmission line, so it is unlikely that the addition of this single circuit would result in a substantial increase in risk to this species from colliding with transmission lines along this alignment. Potential risks to peregrine falcon or bald eagle as a result of the addition of this new circuit would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines and would pose minimal threats to the Swainson's hawk, peregrine falcon, and bald eagle. Ground and air monitoring of the lines would be limited in potential habitat along the transmission lines during the nesting and breeding season. Temporary increased human presence, noise, and dust may occur and may result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect these species. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Potential risks to these species as a result of BRRTP operation and maintenance requirements would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required element of BRRTP..

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, the Swainson's hawk, peregrine falcon, or bald eagle. The new 230 kV circuit would have **no effect** on Swainson's hawk. The reconductoring would have **no effect** on the bald eagle.

Alternative 2: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, the Swainson's hawk, peregrine falcon, or bald eagle. The new 230 kV circuit would have **no effect** on Swainson's hawk. The new 230 kV transmission line and reconductoring would have **no effect** on bald eagle.

Alternative 2a: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, the Swainson's hawk, peregrine falcon, or bald eagle. The new 230 kV circuit would have **no effect** on Swainson's hawk. The new 230 kV transmission line and reconductoring would have **no effect** on bald eagle.

Alternative 3: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for**, the Swainson's hawk, peregrine falcon, or bald eagle. The new 230 kV circuit would have **no effect** on Swainson's hawk. The new 230 kV transmission line and reconductoring would have **no effect** on bald eagle.

California Spotted Owl

New 230 kV Transmission Line

Alternative 1 – Along Segment D, there may be direct or indirect effects to California spotted owl, expected to be unlikely to occur due to limited potential habitat (POWER 2009b, POWER 2010d). There are no reported occurrences along this segment. During the 2008 and 2009 surveys, eight nesting and potential foraging habitat locations were identified and focused surveys were conducted at three of these, with the rest determined to be of too poor habitat to survey. However, no individuals were detected during this two-year survey.

Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to potential spotted owl habitat. Figure 7, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction. Implementation of Forest Plan Standard S20 would restrict construction within 0.25 mile of any California spotted owl nest site or activity center with an unknown nesting status during the breeding season (February 1 – August 15) unless Forest Service protocol surveys determine that spotted owls are absent. This would reduce impacts to nesting California spotted owls and their young. This standard is implemented into mitigation measure BIO-19 (Protect California spotted owl).

General practices that would reduce short-term or long-term effects to California spotted owl include GP-8, GP-24, GP-25, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short-term or long-term effects to California spotted owl include AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-19 (Protect California spotted owl).

Mitigation Measures for Impacts to California Spotted Owl

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-2 **Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.** This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 **Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.** This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 **Implement a Worker Environmental Awareness Program.** This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-11 **Reduce avian collisions with and electrocutions on transmission lines.** This mitigation measure would require LADWP to implement the latest APLIC guidelines in the design of new Project structures and to develop an Avian Protection Plan for the Project. (Refer to Table 2 for the full text of this mitigation measure)

BIO-19 Protect California spotted owl. This mitigation measure would require LADWP to conduct FS protocol surveys for the California spotted owl prior to construction within any suitable habitat and to avoid all construction or helicopter activity in the vicinity of any identified nests or active pairs between February 1 and August 15 or until chicks have fledged. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – Under Segment G, there may be direct or indirect effects to California spotted owl, expected to have a possibility of occurring due to availability of suitable habitat in Baird Canyon, Craig Spring, Clearwater Canyon, San Francisquito Canyon, Grass Mountain, Pettinger Canyon, and Spunky Canyon as determined during 2008 and 2009 surveys (POWER 2009b, POWER 2010d). Habitat degradation and/or loss will occur for this species on this segment, as many of the areas that were determined to be suitable habitat during surveys are directly within the survey corridor. Depending on specific and final tower locations, these may be able to be spanned over or avoided. However, they may be impacted by construction if they cannot be avoided, such as by tree trimming where necessary for equipment access. This could, by extension, lead to injury or mortality of any spotted owls that may be present in the affected trees. Habitat loss and/or degradation may also make suitable California spotted owl habitat less attractive for future use by this species, potentially requiring individuals to find and/or utilize new habitat patches. Construction during nesting season may cause owls to leave the area entirely if they become too distressed by the activity, which could in turn lead to harm if owls are pushed into areas that are unfamiliar or unsuitable for them. Implementation of Forest Plan Standard S20 would restrict construction within 0.25 mile of any California spotted owl nest site or activity center with an unknown nesting status during the breeding season (February 1 – August 15) unless Forest Service protocol surveys determine that spotted owls are absent. This would reduce impacts to nesting California spotted owls and their young. This standard is implemented into mitigation measure BIO-19 (Protect California spotted owl). Dust will likely be a factor from construction, and will without proper use of a water truck or equivalent mechanisms have the potential to drift onto adjacent vegetation, degrading its quality.

General practices that would reduce short-term or long-term effects to California spotted owl include GP-8, GP-24, GP-25, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short-term or long-term effects to California spotted owl include AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-19 (Protect California spotted owl).

Alternative 2a – Under Segments G and 2a, there may be direct or indirect effects to California spotted owl, expected to have a possibility of occurring due to availability of suitable habitat in Baird Canyon, Craig Spring, Clearwater Canyon, San Francisquito Canyon, Grass Mountain, Pettinger Canyon, Spunky Canyon, and South Portal Canyon as determined during 2008 and 2009 surveys (POWER 2009b, POWER 2010d). Due to the limited road access along Segment 2a, helicopter construction would be used to limit the anticipated impacts to the California spotted owl within this area. Figure 7, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction. If woodland areas need to be crossed, branch trimming would likely be required to allow equipment to pass. This could lead to injury or mortality of any spotted owls that may be present in the affected trees. Habitat loss and/or degradation may also make suitable California spotted owl habitat less attractive for future use by this species, potentially requiring individuals to find and/or utilize new habitat patches. During spotted owl surveys conducted for BRRTP, suitable habitat was located along the southernmost 1.75 miles of South Portal Canyon. The new transmission line would be 0.25 mile from the bottom of the main canyon at its closest point and 0.55 mile at its farthest point. Along with the potential for any birds that may be present to be affected by the construction noise, there is also the potential for runoff from the construction to wash down side drainages and into the main South Portal Canyon streambed, particularly following heavy rain events. This would degrade habitat and potentially stress individual birds that may be present in the canyon. Direct habitat loss would depend on the potential for any direct access into South Portal Canyon, which is not expected because the proposed corridor in this area runs alongside the top of Tule Ridge for most of its course. Construction during nesting season may cause owls to leave the area entirely if they become too distressed by the activity, which could in turn lead to harm if owls are pushed into areas that are unfamiliar or unsuitable for them. Implementation of Forest Plan Standard S20 would restrict construction within 0.25 mile of any California spotted owl nest site or activity center with an unknown nesting status during the breeding season (February 1 – August 15) unless Forest Service protocol surveys determine that spotted owls are absent. This would reduce impacts to nesting California spotted owls and their young. This standard is implemented into mitigation measure BIO-19 (Protect California spotted owl).

General practices that would reduce short-term or long-term effects to California spotted owl include GP-8, GP-24, GP-25, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short-term or long-term effects to California spotted owl include AIR-2a (Implement construction fugitive dust control plan), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-19 (Protect California spotted owl).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for the California spotted owl under the Alternative 2 and Alternative 2a sections. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Addition of the new 230 kV circuit to the existing transmission line may result in direct or indirect effects to California spotted owl, expected to have a possibility of occurring due to availability of suitable habitat in Charlie Canyon and Dry Canyon as determined during 2008 and 2009 surveys (POWER 2009b, POWER 2010d). Habitat degradation and/or loss would occur for this species in Charlie Canyon, as the areas that were determined to be suitable habitat during surveys are located alongside the road, possibly resulting in dust deposition and/or branch trimming of trees along this area. This could lead to injury or mortality of any spotted owls that may be present in the affected trees. Habitat loss and/or degradation may also make suitable California spotted owl habitat less attractive for future use by this species, potentially requiring individuals to find and/or utilize new habitat patches. Construction during nesting season may cause owls to leave the area entirely if they become too distressed by the activity, which could in turn lead to harm if owls are pushed into areas that are unfamiliar or unsuitable for them. Implementation of Forest Plan Standard S20 would restrict construction within 0.25 mile of any California spotted owl nest site or activity center with an unknown nesting status during the breeding season (February 1 – August 15) unless Forest Service protocol surveys determine that spotted owls are absent. This would reduce impacts to nesting California spotted owls and their young. This standard is implemented into mitigation measure BIO-19 (Protect California spotted owl). Potential risks to this species as a result of adding a new conductor to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines could pose a threat to the California spotted owl. Ground and air monitoring of the lines would be limited in potential habitat during the nesting and breeding season. Temporary increased human presence, noise, and dust may occur and may result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect this species unless it results in unintentional damage to trees or other California spotted owl habitat or if it interferes with California spotted owl daily activities. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures such as briefing crews on sensitive animal procedures and minimized operations in sensitive habitats, as conditions permit. Operation and maintenance of the BRRTP would likely cause minimal impacts to the species, as ongoing maintenance is currently being conducted along the new 230 kV circuit and the reconductoring component within the existing ROW and would cause short-term temporary impacts. Potential risks to this species as a result of operations and maintenance of the BRRTP would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP would have **no effect** on the California spotted owl.

Alternative 2: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California spotted owl.

Alternative 2a: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California spotted owl.

Alternative 3: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP would have **no effect** on the California spotted owl.

Bat Species (Pallid Bat, Townsend's Big-eared Bat, and Western Red Bat)

New 230 kV Transmission Line

Alternative 1 – There may be direct or indirect construction impacts to pallid bat, Townsend's big-eared bat, and western red bat. All three species are expected to be likely to occur based on the availability of suitable habitat on Segment D, such as rocky areas for roosting in the mountainous region of the segment, along with riparian habitat and chaparral for foraging throughout this same area. Tower construction and grading of new or existing access roads will result in loss of foraging habitat and degradation in habitat quality, although tower construction may provide some additional roosting habitat. Pallid bats and Townsend's big-eared bats in particular are sensitive to human disturbance, and construction during summer months when activity is higher may cause a greater degree of disturbance to the bats, potentially leading to their abandonment of the area (Vaughan and O'Shea 1976, Piaggio 2005). Areas of suitable habitat within this segment are not heavily visited by people. Thus, abandonment can indirectly lead to injury or mortality if it results in encounters with equipment or in decreased fitness at a new location due to unfamiliarity. The bats would likely return to the same roost the following season if it were still available (B. Doering personal communication 2011). Mating for pallid bats occurs from October to February, birth from April to July, and final weaning in August; mating in Townsend's big-eared bats generally occurs between October and February, with birth between May and July; and mating in western red bats occurs in late summer or early fall with birth the following summer (Reid 2006). Construction during certain time periods of these windows may be more disturbing to some bat species than others, if present.

Should a bat roost be disturbed by construction, complete abandonment of the roost may result, particularly for more sensitive species like pallid bats or Townsend's big-eared bats. This may lead to complete nesting failure for the season, resulting in a loss of that year's new bat births. Disruption of hibernation is unlikely given the generally warm winters in Southern California. McNab (1974) suggests that only bats that are both small and do not cluster in groups can hibernate when the environmental temperature is above 14°C (57.2°F). Pallid bats may roost alone or in groups from two to several hundred and, although they will hibernate in cold parts of their range, they overwinter in coastal California (Rambaldini 2005). They have been reported to remain active at temperatures between -5°C (23°F) and 10°C (50°F). Townsend's big-eared bats may hibernate in groups of single individuals to several hundred; in some areas, mainly in the eastern U.S., they may hibernate in groups up to several thousand (Piaggio 2005). Although winter behavior of western red bats is not well understood, it is possible that they also do not hibernate for long periods, as this species has been reported to be found foraging during the winter on warm days, even in northern California (Bolster 2005). It is likely that bats in the Project area would periodically enter states of torpor but would generally remain relatively active compared to bats in colder parts of the country, where hibernation is more feasible.

General practices that would reduce short- or long-term effects to special-status bat species include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short- or long-term effects to special-status bat species include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-21 (Protect sensitive bat species).

Mitigation Measures for Impacts to Bat Species

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, Forest Service, or CDFG jurisdiction to the maximum extent feasible and to provide restoration/compensation where applicable. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-5 **Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.** This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-6 **Implement a Worker Environmental Awareness Program.** This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-21 **Protect sensitive bat species.** This mitigation measure would require LADWP to conduct surveys for special-status bat species in the Project vicinity prior to construction and during the maternity season; to avoid active maternity roosts or hibernacula as feasible; to provide substitute roosting habitat when maternity roosts will be disturbed by Project construction; and to evict all bats prior to any destruction of roosts; to survey for bat nursery colonies. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

Alternative 2 – Under Segment G, there may be direct or indirect construction impacts to pallid bat, Townsend's big-eared bat, and western red bat. All three species are expected to be likely to occur based on the availability of suitable habitat on Segment G, such as rocky areas for roosting on the western side of San Francisquito Canyon; water in San Francisquito Canyon, Dry Canyon, and Drinkwater Reservoir; and foraging habitat in the shrubs and grassland throughout the alignment. Tower construction and grading of new or existing access roads will result in loss of foraging habitat and degradation in habitat quality, although tower construction may provide some additional roosting habitat. Pallid bats and Townsend's big-eared bats in particular are sensitive to human disturbance, and construction during summer months when activity is higher may cause a greater degree of disturbance to the bats, potentially leading to their abandonment of the area (Vaughan and O'Shea 1976, Piaggio 2005). This can indirectly lead to injury or mortality if it results in encounters with equipment or in decreased fitness at a new location due to unfamiliarity. The bats would likely return to the same roost the following season if it were still available (B. Doering personal communication 2011). Mating for pallid bats occurs from October to February, birth from April to July, and final weaning in August; mating in Townsend's big-eared bats generally occurs between October and February, with birth between May and July; and mating in western red bats occurs in late summer or early fall with birth the following summer (Reid 2006). Construction during certain time periods of these windows may be more disturbing to some bat species than others, if present.

Should a bat roost be disturbed by construction, it may result in complete abandonment of the roost, particularly for more sensitive species like pallid bats or Townsend's big-eared bats. This may lead to complete nesting failure for the season, resulting in a loss of that year's new bat births. Disruption of hibernation is unlikely, given the generally warm winters in Southern California. McNab (1974) suggests that only bats that are both small and do not cluster in groups can hibernate when the environmental temperature is above 14°C (57.2°F). Pallid bats may roost alone or in groups from two to several hundred and, although they will hibernate in cold parts of their range, they overwinter in coastal California (Rambaldini 2005). They have been reported to remain active at temperatures between -5°C (23°F) and 10°C (50°F). Townsend's big-eared bats may hibernate in groups of single individuals to several hundred; in some areas, mainly in the eastern U.S., they may hibernate in groups up to several thousand (Piaggio 2005). Although winter behavior of western red bats is not well understood, it is possible that they also do not hibernate for long periods, as this species has been reported to be found foraging during the winter on warm days, even in northern California (Bolster 2005). It is likely that bats in the Project area would periodically enter states of torpor but would generally remain relatively active compared to bats in colder parts of the country, where hibernation is more feasible.

General practices that would reduce short- or long-term effects to special-status bat species include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short- or long-term effects to special-status bat species include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-21 (Protect sensitive bat species).

Alternative 2a – Under Segments G and 2a, there may be direct or indirect construction impacts to pallid bat, Townsend's big-eared bat, and western red bat. All three species are expected to be likely to occur based on the availability of suitable habitat on Alternative 2a, such as rocky areas for roosting on the western side of San Francisquito Canyon; water in San Francisquito Canyon, Dry Canyon, South Portal Canyon, and Drinkwater Reservoir; and foraging habitat in the shrubs and grassland throughout the alignment. Tower construction and grading of new or existing access roads on Segment G will result in loss of foraging habitat and degradation in habitat quality, although tower construction may provide some additional roosting habitat. There is little suitable habitat directly under the transmission line within the South Portal Canyon area, but there is more abundant habitat for roosting and foraging at the canyon bottom within the streambed area. Because bats are mainly nocturnal, construction on the ridge in Segment 2a during the day is unlikely to disturb them. Pallid bats and Townsend's big-eared bats in particular are sensitive to human disturbance, and construction during summer months when activity is higher may cause a greater degree of disturbance to the bats, potentially leading to their abandonment of the area (Vaughan and O'Shea 1976, Piaggio 2005). This can indirectly lead to injury or mortality if it results in encounters with equipment or in decreased fitness at a new location due to unfamiliarity. The bats would likely return to the same roost the following season if it were still available (B. Doering personal communication 2011). Mating for pallid bats occurs from October to February, birth from April to July, and final weaning in August; mating in Townsend's big-eared bats generally occurs between October and February, with birth between May and July; and mating in western red bats occurs in late summer or early fall with birth the following summer (Reid 2006). Construction during certain time periods of these windows may be more disturbing to some bat species than others, if present.

Should a bat roost be disturbed by construction, it may result in complete abandonment of the roost, particularly for more sensitive species like pallid bats or Townsend's big-eared bats. This may lead to complete nesting failure for the season, resulting in a loss of that year's new bat births. Disruption of hibernation is unlikely, given the generally warm winters in Southern California. McNab (1974) suggests that only bats that are both small and do not cluster in groups can hibernate when the environmental temperature is above 14°C (57.2°F). Pallid bats may roost alone or in groups from two to several hundred and, although they will hibernate in cold parts of their range, they overwinter in coastal California (Rambaldini 2005). They have been reported to remain active at temperatures between -5°C (23°F) and 10°C (50°F). Townsend's big-eared bats may hibernate in groups of single individuals to several hundred; in some areas, mainly in the eastern U.S., they may hibernate in groups up to several thousand (Piaggio 2005). Although winter behavior of western red bats is not well understood, it is possible that they also do not hibernate for long periods, as this species has been reported to be found foraging during the winter on warm days, even in northern California (Bolster 2005). It is likely that bats in the Project area would periodically enter states of torpor but would generally remain relatively active compared to bats in colder parts of the country, where hibernation is more feasible.

General practices that would reduce short- or long-term effects to special-status bat species include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short- or long-term effects to special-status bat species include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-21 (Protect sensitive bat species).

Alternative 3 – Under Segment I, there may be direct or indirect construction impacts to pallid bat, Townsend's big-eared bat, and western red bat. All three species are expected to be likely to occur based on the availability of suitable habitat on Segment I, such as rocky areas for roosting in the mountainous region of the segment, along with riparian habitat and chaparral for foraging throughout this same area. Tower construction and grading of new or existing access roads will result in loss of foraging habitat and degradation in habitat quality, although tower construction may provide additional roosting habitat for the western mastiff bat. Pallid bats and Townsend's big-eared bats in particular are sensitive to human disturbance, and construction during summer months when activity is higher may cause a greater degree of disturbance to the bats, potentially leading to their abandonment of the area (Vaughan and O'Shea 1976, Piaggio 2005). Areas of suitable habitat within this segment are not heavily visited by people. Thus, abandonment can indirectly lead to injury or mortality if it results in encounters with equipment or in decreased fitness at a new location due to unfamiliarity. The bats would likely return to the same roost the following season, if it were still available (B. Doering personal communication 2011). Mating for pallid bats occurs from October to February, birth from April to July, and final weaning in August; mating in Townsend's big-eared bats generally occurs between October and February, with birth between May and July; mating in western mastiff bats typically begins in early March with birth ending in September; and mating in western red bats occurs in late summer or early fall with birth the following summer (Reid 2006). Construction during certain time periods of these windows may be more disturbing to some bat species than others, if present.

Should a bat roost be disturbed by construction, it may result in complete abandonment of the roost, particularly for more sensitive species like pallid bats or Townsend's big-eared bats. This may lead to complete nesting failure for the season, resulting in a loss of that year's new bat births. Disruption of hibernation is unlikely given the generally warm winters in Southern California. McNab (1974) suggests that only bats that are both small and do not cluster in groups can hibernate when the environmental temperature is above 14°C (57.2°F). Pallid bats may roost alone or in groups from two to several hundred and although they will hibernate in cold parts of their range, they overwinter in coastal California (Rambaldini 2005). They have been reported to remain active at temperatures between -5°C (23°F) and 10°C (50°F). Townsend's big-eared bats may hibernate in groups of single individuals to several hundred; in some areas, mainly in the eastern U.S., they may hibernate in groups up to several thousand (Piaggio 2005). Although winter behavior of western red bats is not well understood, it is possible that they also do not hibernate for long periods, as this species has been reported to be found foraging during the winter on warm days, even in northern California (Bolster 2005). It is likely that bats in the Project area would periodically enter states of torpor but would generally remain relatively active compared to bats in colder parts of the country, where hibernation is more feasible.

General practices that would reduce short- or long-term effects to special-status bat species include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short- or long-term effects to special-status bat species include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-21 (Protect sensitive bat species).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for pallid bat, Townsend's big-eared bat, and western red bat impacts in the preceding sections under Alternatives 2 and 2a. Potential risks to these species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Construction work on the new 230 kV circuit is not expected to notably reduce suitable habitat for the bat species named above. Foraging habitat may be degraded as a result of the spread of non-native species, dust deposition, or soil compaction, but habitat effects are expected to be relatively low due to the probable low amount of disturbance that will result from adding the additional conductor to the existing transmission lines. Should spur roads need to be constructed or reestablished, there may be habitat loss or degradation in isolated locations. Rocky roosting habitat is minimal along this area. Although the western side of San Francisquito Canyon has rocky habitat, this is primarily several miles north of this corridor. The few buildings located directly under or adjacent to this ROW are primarily homes in San Francisquito Canyon, and the likelihood of bats roosting in them is low; if bats are present, temporary construction effects would likely not be significantly more disturbing than daily residential activity. However, if bats are present roosting around the building or yard that are approximately two linear miles south of the northern end of this corridor, which are not public areas, there may be a greater disturbance from construction presence on nearby towers, potentially causing bats to vacate the area. Potential risks to these species as a result of adding a new conductor to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines pose minimal threat to pallid bat, Townsend's big-eared bat, and western red bat. Ground and air monitoring of the lines would be limited in potential habitat along the transmission line corridors during the nesting and breeding season. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access may affect these species if they are roosting very close nearby, potentially causing arousals or temporary abandonments. During emergency operations temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats as conditions permit. Potential risks to these species as a result of operation and maintenance activities for the BRRTP would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the pallid bat, Townsend's big-eared bat, and western red bat.

Alternative 2: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the pallid bat, Townsend's big-eared bat, and western red bat.

Alternative 2a: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the pallid bat, Townsend's big-eared bat, and western red bat.

Alternative 3: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the pallid bat, Townsend's big-eared bat, and western red bat.

Tehachapi Pocket Mouse

New 230 kV Transmission Line

Alternative 1 – There may be direct or indirect construction impacts to Tehachapi pocket mouse, expected to be unlikely to occur on Segment D. There are nine occurrences from the CNDDB within ten miles of the ANF in the Alternative 1 vicinity; however, most of these are greater than ten years old and/or extirpated (CNDDB 2011). Of those which are extant, only three are within five miles of the ANF boundary, the most recent of which is 1974. Tower construction and grading of new or existing access roads would result in habitat loss, resulting in a decrease in food availability for this species and possibly an increase in predation risk due to reduced vegetation cover. Preconstruction surveys would identify any burrows in the area, but for burrows which are dug under shrubs, they may be difficult to see, leaving a possibility that burrows would go unnoticed. These burrows may be crushed during construction, resulting in possible injury or death to one or more individuals and a reduction in suitable hiding places. Individuals may be scared out of burrows if they are near construction, which may result in injury or mortality by construction or predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any Tehachapi pocket mice in the area which may fall into them. Should any individuals be present in the work area, they would likely be unaccustomed to human presence due to the lack of human activity in along the northwest portion of the ANF in the Ridge Route/Edison Spring Road area. There is currently a relative lack of information known about the ecology of the Tehachapi pocket mouse. It is believed that it is nocturnal and that it hibernates seasonally. It may also enter periods of inactivity when the ambient temperature is exceptionally high or low such as in summer or winter, respectively (CDFG 2008). Because of this, this species may be less likely to be disturbed by construction.

General practices that would reduce short- or long-term effects to Tehachapi pocket mouse include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to Tehachapi pocket mouse include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-20 (Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox).

Mitigation Measures for Impacts to Tehachapi Pocket Mouse

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 **Use of Existing Water Crossings.** This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 **Provide restoration/compensation for impacted sensitive vegetation communities.** This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 **Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.** This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-5 **Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.** This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-6 **Implement a Worker Environmental Awareness Program.** This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-20 **Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox.** This mitigation measure would require LADWP to conduct preconstruction surveys for American badger, Mohave ground squirrel, Tehachapi pocket mouse, and desert kit fox and to avoid occupied habitat where possible. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

Alternative 2 – There may be direct or indirect construction impacts to Tehachapi pocket mouse, expected to have a possibility of occurring along Segment G based on availability of suitable habitat and on historical occurrences in the Lake Hughes and Elizabeth Lake areas (CDFG 2011). Tower construction and grading of new or existing access roads would result in habitat loss, resulting in a decrease in food availability for this species and possibly an increase in predation risk due to reduced vegetation cover. Preconstruction surveys would identify any burrows in the area, but for burrows which are dug under shrubs, they may be difficult to see, leaving a possibility that burrows would go unnoticed. These burrows may be crushed during construction, resulting in possible injury or death to one or more individuals and a reduction in suitable hiding places. Individuals may be scared out of burrows if they are near construction, which may result in injury or mortality by construction or predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any Tehachapi pocket mice in the area which may fall into them. Should any individuals be present in the work area, they may be relatively accustomed to human presence due to the human activity in the Elizabeth Lake and Green Valley areas. There is currently a relative lack of information known about the ecology of the Tehachapi pocket mouse. It is believed that it is nocturnal and that it hibernates seasonally. It may also enter periods of inactivity when the ambient temperature is exceptionally high or low such as in summer or winter, respectively (CDFG 2008). Because of this, this species may be less likely to be disturbed by construction.

General practices that would reduce short- or long-term effects to Tehachapi pocket mouse include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to Tehachapi pocket mouse include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-20 (Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox).

Alternative 2a – There may be direct or indirect construction impacts to Tehachapi pocket mouse, expected to have a possibility of occurring along Segments G and 2a based on availability of suitable habitat and on historical occurrences in the Lake Hughes and Elizabeth Lake areas (CDFG 2011). Tower construction and grading of new or existing access roads would result in habitat loss, resulting in a decrease in food availability for this species and possibly an increase in predation risk due to reduced vegetation cover. Preconstruction surveys would identify any burrows in the area, but for burrows which are dug under shrubs, they may be difficult to see, leaving a possibility that burrows would go unnoticed. These burrows may be crushed during construction, resulting in possible injury or death to one or more individuals and a reduction in suitable hiding places. Individuals may be scared out of burrows if they are near construction, which may result in injury or mortality by construction or predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any Tehachapi pocket mice in the area which may fall into them. Should any individuals be present in the work area, they may be relatively accustomed to human presence due to the human activity in the Elizabeth Lake and Green Valley areas. There is currently a relative lack of information known about the ecology of the Tehachapi pocket mouse. It is believed that it is nocturnal and that it hibernates seasonally. It may also enter periods of inactivity when the ambient temperature is exceptionally high or low such as in summer or winter, respectively (CDFG 2008). Because of this, this species may be less likely to be disturbed by construction.

General practices that would reduce short- or long-term effects to Tehachapi pocket mouse include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to Tehachapi pocket mouse include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-20 (Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox).

ANF Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for the Tehachapi pocket mouse under the Alternative 2 and Alternative 2a sections. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operations and Maintenance

Operation and maintenance of the proposed transmission lines could pose a threat to the Tehachapi pocket mouse. Ground monitoring of the lines may minimally impact potential habitat, but air monitoring would have no effect. Temporary increased dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access may affect this species if it is present in the roadway or if its burrows are in an area that is impacted by the grading activity. This may result in injury to individual pocket mice or to damage to burrows. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Operation and maintenance of the BRRTP would have no effect on the Tehachapi pocket mouse. Operation and maintenance is a required component of BRRTP and would occur regardless of which alternative is ultimately chosen for construction.

Effects Determination

Alternative 1: The new 230 kV transmission line and reconductoring of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability** for the Tehachapi pocket mouse. Construction of the new 230 kV circuit and operation and maintenance of the transmission line would have **no effect** on this species.

Alternative 2: The new 230 kV transmission line and reconductoring of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability** for the Tehachapi pocket mouse. Construction of the new 230 kV circuit and operation and maintenance of the transmission line would have **no effect** on this species.

Alternative 2a: The new 230 kV transmission line and reconductoring of the BRRTP **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability** for the Tehachapi pocket mouse. Construction of the new 230 kV circuit and operation and maintenance of the transmission line would have **no effect** on this species.

Alternative 3: The new 230 kV transmission line, reconductoring, new 230 kV circuit, and operation and maintenance of the BRRTP would have **no effect** on the Tehachapi pocket mouse.

Arroyo Chub

New 230 kV Transmission Line

Alternative 1 – There are no reported sightings along Segment D, but there are isolated spots of appropriate sandy stream bottoms which will have to be crossed for access. However, these areas are believed to be dry most of the year based on 2008 and 2009 surveys and the streams along this alternative likely do not support a population of the fish.

General practices that would reduce short-term and long-term effects to arroyo chub and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo chub and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

Mitigation Measures for Effects to Arroyo Chub

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to the Mitigation Planning Section for the full text of this mitigation measure.)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek USFS approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the USFS; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, USFS, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – There may be direct or indirect impacts to the arroyo chub, expected to have a possibility of occurring within the proposed Alternative 2 corridor based on its known presence within the Drinkwater and/or Dam Reaches of San Francisquito Creek over the last decade (USGS 2002, USGS 2003, USGS 2004, USGS 2005a, USGS 2005b, USGS 2007, USGS 2008, USGS 2010, USGS 2011). However, upstream of this isolated portion, San Francisquito Creek is not known to be perennial until north of Bee Canyon. The area between Bee Canyon and the known population is intermittent and has been observed to be dry most of the year. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present anywhere in San Francisquito Creek upstream of Forest Road 5N27. Direct impacts to this species could include crushing or disruption of life history during construction by vehicles or equipment in stream crossings at Bee Canyon, should it be present, along with habitat degradation. Project equipment and vehicles could spill vehicular fluids into the water or could carry non-native plant seeds in their tires or on their carriages, potentially resulting in the spread of non-native plant species if the seeds fall off and propagate in new areas, such as suitable arroyo chub habitat. Repeated stream crossings may also disrupt or destroy suitable breeding or spawning habitat.

A watershed analysis was also conducted for BRRTP (BRRTP Water Resources Technical Report 2011). The purpose of this analysis was not to calculate a precise quantity of sediment delivered to catchments within the study area, but to use the predicted volumes of soil loss to qualitatively compare the erosional effects of each BRRTP Alternative route within the ANF. It is important to note that the predicted rates of erosion do not reflect the amount of sediment that would be transported out of the watersheds; rather, the predicted values are an estimate of erosion that would occur as a result of construction and operation of the BRRTP. In actuality, much of the sediment eroded from construction areas and roads would be redeposited before leaving the watershed. In addition, due to the scale of this analysis, the predicted post-Project erosion values do not reflect implementation of General Practices or mitigation measures and represent a worst-case scenario.

As part of this analysis, two tests were run. The first was a Revised Universal Soil Loss Equation, Version 2 (RUSLE), selected to predict annual erosion from Project-related ground disturbance. The RUSLE model predicts long-term average soil loss expressed in tons per acre per year. For analysis of erosion resulting from the Project, road construction or improvement of existing roads at least five miles from the ROW were included in this analysis. Once baseline values were estimated, the change in annual erosion rates (tons/acre/year) was estimated for each subwatershed as a result of construction of the transmission line routes for each Alternative (e.g., vegetation clearing related to road construction). Using these results, the increase of erosion from baseline conditions was calculated. The Alternative 2 transmission line would result in an erosion increase of 1.18 percent over baseline. The second test was a WinTR-55 statistical analysis, used to determine what effect, if any, Project-related ground disturbance would have on watershed hydrology. Due to the comparatively large size of the watersheds, a relative approach was utilized to determine effects of BRRTP Alternatives on watershed hydrology. Rather than delineating and modeling all watersheds in the BRRTP area, a representative sample of smaller subwatersheds was selected, in collaboration with the ANF, to provide a representative sample of the varied characteristic of the area watersheds. If little or no change were determined in these subwatersheds, then it could be logically assumed that similar percentages of change (*i.e.*, post-construction changes from baseline) would occur in similar subwatersheds with similar Project-related impacts. If, however, the model produced significant differences between pre- and post-construction conditions, modeling of the remaining subwatersheds would be required to quantify impacts. In the analysis of the Lake Elizabeth subwatershed, which was estimated to be representative of all watersheds affected by Alternative 2, the difference between pre- and post-construction hydrology was not statistically significant. Therefore it is expected that hydrological changes to the San Francisquito Canyon watershed as a result of Alternative 2 construction would also not be statistically significant between pre- and post-construction conditions.

General practices that would reduce short-term and long-term effects to arroyo chub and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo chub and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

Alternative 2a – There may be direct or indirect impacts to the arroyo chub, expected to have a possibility of occurring within the proposed Alternative 2a corridor based on its known presence within the Drinkwater and/or Dam Reaches of San Francisquito Creek over the last decade (USGS 2002, USGS 2003, USGS 2004, USGS 2005a, USGS 2005b, USGS 2007, USGS 2008, USGS 2010, USGS 2011). However, upstream of this isolated portion, San Francisquito Creek is not known to be perennial until north of Bee Canyon. The area between Bee Canyon and the known population is intermittent and has been observed to be dry most of the year. There are no known occurrences within the Segment 2a portion of the Alternative 2a. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present anywhere in San Francisquito Creek upstream of Forest Road 5N27. Direct impacts to this species could include crushing or disruption of life history during construction by vehicles or equipment in stream crossings at Bee Canyon, should it be present, along with habitat degradation. Project equipment and vehicles could spill vehicular fluids into the water or could carry non-native plant seeds in their tires or on their carriages, potentially resulting in the spread of non-native plant species if the seeds fall off and propagate in new areas, such as suitable arroyo chub habitat. Repeated stream crossings may also disrupt or destroy suitable breeding or spawning habitat.

A watershed analysis was also conducted for BRRTP (BRRTP Water Resources Technical Report 2011). See the above summary of the analysis described under Alternative 2 for the results. Results would be applicable to both Alternatives 2 and 2a.

General practices that would reduce short-term and long-term effects to arroyo chub and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo chub and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

Alternative 3 – There are no reported sightings of this species along Segment I, which contains several miles of potentially suitable habitat within Vasquez Canyon and alongside Sierra Highway. However, these streambeds were not observed to be flowing during any of the various surveys which were conducted in 2008 and 2009 for this Project, and may not be able to support a population if there are no perennial water sources. Arroyo chub is expected to be unlikely to occur along Segment I. Indirect impacts to arroyo chub could occur due to runoff from Project equipment passing over stream crossings just upstream of Vasquez Canyon.

General practices that would reduce short-term and long-term effects to arroyo chub and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo chub and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for the arroyo chub under the Alternatives 2 and 2a sections. This species is not known to occur along Segments A, B, or K. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

There are no reported sightings of this species along this corridor, which passes over Dry Canyon, San Francisquito Canyon, Charlie Canyon, and Bitter Canyon. None of these canyons has perennially flowing water at the point that the power lines pass over. The ANF Land Management Plan (USFS 2005c) considers this species to be present within San Francisquito Creek, although it is unclear if it is believed or known to be present in San Francisquito Creek at the point that this Project component crosses the creek. Direct impacts to this species could include crushing or disruption of life history during construction by vehicles or equipment in stream crossings, should it be present. Indirect impacts to arroyo chub could include habitat degradation. This could occur due to runoff from Project equipment passing over stream crossings just upstream of suitable habitat. Additionally, Project equipment and vehicles could carry non-native plant seeds in their tires or on their carriages, potentially resulting in the spread of non-native plant species if the seeds fall off and propagate in new areas, such as suitable arroyo chub habitat. Potential risks to this species as a result of adding a new 230 kV circuit to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines would pose minimal threat to the arroyo chub. Ground and air monitoring of the lines would not impact potential habitat along San Francisquito Creek. Temporary increased dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect this species. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Potential risks to this species as a result of operations and maintenance of the BRRTP would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line and operation and maintenance would have **no effect** on the arroyo chub. Reconductoring of the existing transmission line and addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the arroyo chub.

Alternative 2: Operation and maintenance would have **no effect** on the arroyo chub. The new 230 kV transmission line, reconductoring of the existing transmission line, and addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the arroyo chub.

Alternative 2a: Operation and maintenance would have **no effect** on the arroyo chub. The new 230 kV transmission line, reconductoring of the existing transmission line, and addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the arroyo chub.

Alternative 3: The new 230 kV transmission line and operation and maintenance would have **no effect** on the arroyo chub. Reconductoring of the existing transmission line and addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the arroyo chub.

California Legless Lizard

New 230 kV Transmission Line

Alternative 1 – There are no reported sightings of this species near Segment D, which contains isolated patches of marginal habitat. Construction of towers and grading of new or existing access roads along Alternative 1 is unlikely to result in extensive habitat loss given the marginal quality of much of the habitat present along this alternative for this species. However, in areas where construction is present in habitat that could support this species or if vehicles pass through areas of suitable habitat, they may crush individuals or compact the soil, resulting in long-term reduced habitat quality for this fossorial species. This would also be a concern because legless lizards are primarily active during the morning and evening (Fellers 2009) and would generally be inactive and basking throughout the day, leaving individuals more open to injury or mortality through construction. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any California legless lizards in the area which may get trapped in them. However, construction activities for Alternative 1 are not within potential habitat for the California legless lizard, which is unlikely to occur.

General practices that would reduce short- or long-term effects to California legless lizard include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to California legless lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Mitigation Measures for Impacts to California Legless Lizard

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 **Use of Existing Water Crossings.** This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 **New Road Construction Over Waterways.** This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 **Provide restoration/compensation for impacted sensitive vegetation communities.** This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 **Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.** This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-3 **Incorporate riparian area avoidance and mitigation measures.** This mitigation measure would require LADWP seek Forest Service approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the Forest Service; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 **Provide restoration/compensation for affected jurisdictional areas.** This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, Forest Service, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-22 Protect special-status reptile species. This mitigation measure would require LADWP to retain a qualified biological monitor to oversee reptile protection measures during Project construction. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – There are no reported sightings of this species within Segment G, which contains limited suitable habitat in various locations near or within streambeds. California legless lizard is expected to be unlikely to occur along Segment G. Construction of towers and grading of new or existing access roads along Alternative 2 is unlikely to result in extensive habitat loss given the marginal quality of much of the habitat present along this alternative for this species. However, in areas where construction is present in habitat that could support this species or if vehicles pass through areas of suitable habitat, they may crush individuals or compact the soil, resulting in long-term reduced habitat quality for this fossorial species. This would also be a concern because legless lizards are primarily active during the morning and evening (Fellers 2009) and would generally be inactive and basking throughout the day, leaving individuals more open to injury or mortality through construction. Construction activity near wet or moist riparian areas, such as Drinkwater Flat, San Francisquito Creek, or other intermittent or ephemeral areas, may injure or kill individuals if present. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any California legless lizards in the area which may get trapped in them. However, construction activities for Alternative 2 are not within potential habitat for the California legless lizard, which is unlikely to occur.

General practices that would reduce short- or long-term effects to California legless lizard include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to California legless lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 2a – There are no reported sightings of this species along Segments G or 2a, which contains limited suitable habitat in various locations near or within streambeds. California legless lizard is expected to be unlikely to occur along these areas. Construction of towers and grading of new or existing access roads along Alternative 2a is unlikely to result in extensive habitat loss given the marginal quality of much of the habitat present along this alternative for this species. However, in areas where construction is present in habitat that could support this species or if vehicles pass through areas of suitable habitat, they may crush individuals or compact the soil, resulting in long-term reduced habitat quality for this fossorial species. This would also be a concern because legless lizards are primarily active during the morning and evening (Fellers 2009) and would generally be inactive and basking throughout the day, leaving individuals more open to injury or mortality through construction. Construction activity near wet or moist riparian areas, such as Drinkwater Flat, San Francisquito Creek, or other intermittent or ephemeral areas, may injure or kill individuals if present. No impacts would be expected along the streambed of South Portal Canyon, which is far below the actual construction area located along Tule Ridge Road. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any California legless lizards in the area which may get trapped in them. However, construction activities for Alternative 2a are not within potential habitat for the California legless lizard, which is unlikely to occur.

General practices that would reduce short- or long-term effects to California legless lizard include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to California legless lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 3 – There may be direct or indirect construction impacts to California legless lizard, expected to have a possibility of occurring based on two recent reported occurrences within four miles of Segment I and one 15-year old occurrence 0.20 mile from the segment. One recent occurrence resulted in two dead and two injured individuals, while the second recent occurrence resulted in the translocation of 18 adults and eight juveniles due to impending development at the site. The older sighting was of a dead individual. There may still be locations along this segment that could support this species, although there are no other reported occurrences. This species is known to reside in moist areas, and apparently requires high moisture content in the soil it inhabits. Direct injury or mortality of individuals of this species is possible because it hides under leaf litter and other cover, where it would not be seen. In areas where construction is present in habitat that could support this species or if vehicles pass through areas of suitable habitat, they may crush individuals or compact the soil, resulting in long-term reduced habitat quality for this fossorial species. This would also be a concern because legless lizards are primarily active during the morning and evening (Fellers 2009) and would generally be inactive and basking throughout the day, leaving individuals more open to injury or mortality through construction. Encroachment near riparian areas would be most likely to damage or kill individuals of this species, although open chaparral and even desert scrub may be used by this species (Stebbins 2003). Exposure on the surface during the day may subject it to predation. Habitat loss or degradation could potentially occur where construction or construction access is near riparian areas, chaparral in loose soils, or leaf litter around oak woodlands (Fellers 2009). Because this species tends to occur in moist areas or riparian areas when possible, protecting riparian habitats would benefit it. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any California legless lizards in the area, which may get trapped in them.

General practices that would reduce short- or long-term effects to California legless lizard include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to California legless lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for the California legless lizard under the Alternatives 2 and 2a sections. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Under Segment J, there may be direct or indirect construction impacts to California legless lizard, expected to have a possibility of occurring based on availability of suitable habitat within riparian areas along this component, such as in Dry Canyon and Charlie Canyon. This species is known to reside in moist areas, and apparently requires high moisture content in the soil it inhabits. While both of these streambeds are intermittent, the presence of riparian vegetation in each (such as mulefat) would indicate that the soil may be moist enough to support this species, although the frequency with which water flows through these areas is unknown. Direct injury or mortality of individuals of this species is possible because it hides under leaf litter and other cover, where it would not be seen. In areas where construction is present in habitat that could support this species or if vehicles pass through areas of suitable habitat, they may crush individuals or compact the soil, resulting in long-term reduced habitat quality for this fossorial species. This would also be a concern because legless lizards are primarily active during the morning and evening (Fellers 2009) and would generally be inactive and basking throughout the day, leaving individuals more open to injury or mortality through construction. Encroachment near riparian areas would be most likely to damage or kill individuals of this species, although open chaparral and even desert scrub may be used by it (Stebbins 2003). Exposure on the surface during the day may subject it to predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any California legless lizards in the area which may get trapped in them. Mitigation measures, such as those described above in the Alternatives 1, 2, 2a, and 3 descriptions, would be expected to reduce impacts to this species and minimize the amount of habitat and individuals that could be lost during construction of the BRRTP. Potential risks to this species as a result of adding a new 230 kV circuit to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines would pose minimal threat to the California legless lizard. Ground and air monitoring of the lines would not impact suitable habitat for this species. Temporary increased dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access may affect this species if it is hiding or foraging nearby or crossing the road. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Operation and maintenance of the BRRTP would have no effect on the California legless lizard. Potential risks to this species as a result of operations and maintenance of the BRRTP would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, and operation and maintenance of the BRRTP would have **no effect** on the California legless lizard. Addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California legless lizard.

Alternatives 2: The new 230 kV transmission line, reconductoring, and operation and maintenance of the BRRTP would have **no effect** on the California legless lizard. Addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California legless lizard.

Alternative 2a: The new 230 kV transmission line, reconductoring, and operation and maintenance of the BRRTP would have **no effect** on the California legless lizard. Addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California legless lizard.

Alternative 3: The new 230 kV transmission line and addition of the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the California legless lizard. Reconductoring and operation and maintenance of the BRRTP would have **no effect** on the California legless lizard.

Southwestern Pond Turtle

New 230 kV Transmission Line

Alternative 1 – In fall 2009, a population of at least 17 southwestern pond turtles were discovered in Castaic Creek adjacent to Castaic Power Plant and were relocated upstream in Fish Canyon and Cienaga Canyon. While the turtles may move back downstream, it is unlikely that they will move up and over the opposite ridge toward Alternative 1. There may be other areas throughout Segment D which contain suitable habitat along the streambed, although all stream sections observed in 2008 and 2009, such as Liebre Gulch, have been shallow intermittent stretches. This species is unlikely to occur within the work areas during Project construction. Because there are no known areas of perennial water or deep pools around work areas along this alternative, loss or degradation of riparian habitat that could support this species throughout the year would not occur. Instead, upland habitat may be lost in which individual turtles may overwinter or lay eggs. Upland habitat for this species is generally characterized as areas with abundant canopy cover from vegetation such as willow, blackberry, coyote bush, pine, poison oak, and stinging nettle with heavy leaf litter on the ground for overwintering, and sparse grass or forb vegetation and hard clay or silt soils for nesting (Bettelheim 2005). In areas such as these it is possible that turtles may be injured or killed by construction vehicles or equipment should construction be required for towers or access. Upland habitat which would be suitable for this species when it disperses overland could be lost or degraded by construction activities such as tower construction, road grading, spread of non-native weeds, or soil compaction. However, because there is no known riparian habitat in the vicinity of the proposed ROW that could support turtles for the rest of the year outside of overwintering and oviposition, it is also unlikely that individuals would be found in upland habitat and directly affected by BRRTP construction.

General practices that would reduce short- and long-term effects to southwestern pond turtle include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to southwestern pond turtle include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Mitigation Measures for Impacts to Southwestern Pond Turtle

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 **Use of Existing Water Crossings.** This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 **New Road Construction Over Waterways.** This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 **Provide restoration/compensation for impacted sensitive vegetation communities.** This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 **Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.** This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-3 **Incorporate riparian area avoidance and mitigation measures.** This mitigation measure would require LADWP seek Forest Service approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the Forest Service; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 **Provide restoration/compensation for affected jurisdictional areas.** This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, Forest Service, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 **Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.** This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 **Implement a Worker Environmental Awareness Program.** This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-22 **Protect special-status reptile species.** This mitigation measure would require LADWP to retain a qualified biological monitor to oversee reptile protection measures during Project construction. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – Areas where this turtle has been identified by biologists, which are the Drinkwater and St. Francis Dam reaches of San Francisquito Creek, are not expected to be affected by construction activity, as construction will be over a ridge in Dry Canyon and will not use San Francisquito Canyon as access through this portion of Segment G. Habitat loss should be minimal, judging from the location of sections of habitat relative to the location of the proposed ROW. Habitat is present in a perennial oak riparian woodland area of Dry Canyon beginning roughly at the intersection of Forest Roads 5N27 and 6N21; this area is not known to be inhabited by turtles and no turtles or signs of turtles were observed during any 2008 and 2009 amphibian surveys. This area, additionally, can likely be avoided except by foot traffic during the final line-stringing phase of construction. It is possible that turtles may venture into the construction area during their seasonal migrations into or out of wintering habitat. While most southwestern pond turtles typically do not move more than 500 meters upland, they have also been known to move up to 5 km if sufficiently stressed for appropriate habitat conditions (Bettelheim 2005). Alternative 2 is approximately one mile southeast of the previously documented occupied habitat, but it is probably unlikely that turtles would be able to traverse this distance due to the steep ridge in between San Francisquito Canyon and Dry Canyon, where the proposed ROW is. Should any turtles be present, however, injury or mortality could occur if they were on land or buried for the winter, depending on construction timing. Any turtles that happen to be pushed into the open by construction would also be open to predation.

General practices that would reduce short- and long-term effects to southwestern pond turtle include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to southwestern pond turtle include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 2a – Areas where this turtle has been identified by biologists, which are the Drinkwater and St. Francis Dam reaches of San Francisquito Creek, are not expected to be affected by construction activity, as construction will be over a ridge in Dry Canyon and will not use San Francisquito Canyon as access through this portion of Segment G. There is no suitable habitat to support this species within South Portal Canyon along Segment 2a. Habitat loss should be minimal, judging from the location of sections of habitat relative to the location of the proposed ROW. Habitat is present in a perennial oak riparian woodland area of Dry Canyon beginning roughly at the intersection of Forest Roads 5N27 and 6N21; this area is not known to be inhabited by turtles and no turtles or signs of turtles were observed during any 2008 and 2009 amphibian surveys. This area, additionally, can likely be avoided except by foot traffic during the final line-stringing phase of construction. It is possible that turtles may venture into the construction area during their seasonal migrations into or out of wintering habitat. While most southwestern pond turtles typically do not move more than 500 meters upland, they have also been known to move up to 5 km if sufficiently stressed for appropriate habitat conditions (Bettelheim 2005). Segment G is approximately one mile southeast of the previously documented occupied habitat, but it is probably unlikely that turtles would be able to traverse this distance due to the steep ridge in between San Francisquito Canyon and Dry Canyon, where the proposed ROW is. Should any turtles be present, however, injury or mortality could occur if they were on land or buried for the winter, depending on construction timing. Any turtles that happen to be pushed into the open by construction would also be open to predation.

General practices that would reduce short- and long-term effects to southwestern pond turtle include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to southwestern pond turtle include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Reconductoring

Reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for southwestern pond turtle impacts in the preceding section under new 230 kV transmission line Alternatives 2 and 2a. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

A population of at least 17 southwestern pond turtles was discovered in Castaic Creek in fall 2009 and relocated to Fish Canyon and Cienaga Canyon due to a construction project in the area. Should the turtles move back downstream and reestablish in the same general area as before, they will be approximately 1,000 feet from the northern terminus of the new 230 kV circuit. However, it is unlikely that they would be present or affected by construction, which would be separated from Castaic Creek by the Castaic Power Plant (including material and equipment staging areas, an employee parking lot, and the power plant itself), and no effects would be expected. Potential risks to this species as a result adding a new 230 kV circuit to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines pose minimal threat to southwestern pond turtle. Ground monitoring of the lines would be limited in potential habitat along the transmission line corridors during the nesting and breeding season; air monitoring would not be expected to have any impact. Temporary increased human presence, noise, and dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect this species unless it were crossing the road or wintering within it, which is unlikely. During emergency operations temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats as conditions permit. Operation and maintenance of the BRRTP would have no effect on southwestern pond turtles. Potential risks to this species as a result of operation and maintenance of the Project would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, the new 230 kV circuit, and operation and maintenance of the BRRTP would have **no effect** on the southwestern pond turtle. Reconductoring of the existing line **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the southwestern pond turtle.

Alternative 2: The new 230 kV transmission line and reconductoring **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the southwestern pond turtle. The addition of the new 230 kV circuit and operation and maintenance of the BRRTP would have **no effect** on the southwestern pond turtle.

Alternative 2a: The new 230 kV transmission line and reconductoring **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the southwestern pond turtle. The addition of the new 230 kV circuit and operation and maintenance of the BRRTP would have **no effect** on the southwestern pond turtle.

Alternative 3: The new 230 kV transmission line, the new 230 kV circuit, and operation and maintenance of the BRRTP would have **no effect** on the southwestern pond turtle. Reconductoring of the existing line **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the southwestern pond turtle.

Snake Species (San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-striped Garter Snake)

New 230 kV Transmission Line

Alternative 1 – Under Segment D, there may be direct or indirect effects to coastal rosy boa or two-striped garter snake. San Bernardino ringneck snake is not expected to occur on this segment. Coastal rosy boa is expected to be likely to occur based on availability of suitable terrestrial and aquatic habitat consisting of abundant chaparral along Segment D, particularly north of Templin Highway, combined with various areas of canyon and wash habitat, such as in Liebre Gulch or in and around Charlie Canyon. Two-striped garter snake is expected to be unlikely to occur because although several individuals were identified by POWER approximately three miles upstream of Castaic Power Plant, the streambeds which run under Segment D are not perennial and were observed during BRRTP surveys to be dry for much of the year. Construction of new towers and access roads will result in vegetation and habitat loss, and any movement of rocky areas for construction purposes may destroy additional habitat and refuges. Moving rocks may also result in injury or mortality if any snakes are present in between the rocks or on the ground adjacent to them. Excessive disturbance to washes or streambeds may have additional impacts to habitat, as these snake species are attracted to water sources, particularly two-striped garter snake (Stebbins 2003). Disrupting rodents or herpetofauna could also cause reductions in food supply for any snakes that may be in or near the ROW, while displacing snakes into the open may cause increases in predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any snakes in the area which may get trapped in them. Finally, individuals may be unintentionally run over by construction traffic should they be basking on the ground and undetected. Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the snake species from ground disturbance. Figure 7, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction.

General practices and mitigation measures protecting riparian habitat and water quality would help to protect areas where these species, particularly the two-striped garter snake, may be found. General practices that would reduce short- or long-term effects to coastal rosy boa and two-striped garter snake include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to coastal rosy boa and two-striped garter snake include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Mitigation Measures for Impacts to Snake Species

AIR-2a Implement construction fugitive dust control plan. This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 Use of Existing Water Crossings. This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-2 New Road Construction Over Waterways. This mitigation measure would require roads to be built as near as possible to right angles to streams and washes if feasible; to install culverts where necessary; to minimize disturbance to vegetation and streambeds; to utilize dust control measures during construction; and to leave existing roads in a condition equal to or better than their preconstruction conditions. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-3 Incorporate riparian area avoidance and mitigation measures. This mitigation measure would require LADWP seek Forest Service approval prior to any construction or habitat modification within RCAS; prepare an RCA Treatment Plan in consultation with the Forest Service; avoid impacts to RCAs to the extent feasible; restore all affected RCAs to their pre-construction conditions; and restore or preserve off-site habitat where permanent RCA impacts are unavoidable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-4 Provide restoration/compensation for affected jurisdictional areas. This mitigation measure would require LADWP to avoid impacts to areas under USACE, RWQCB, Forest Service, or CDFG jurisdiction to the extent feasible and to provide restoration/compensation where applicable. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-22 Protect special-status reptile species. This mitigation measure would require LADWP to retain a qualified biological monitor to oversee reptile protection measures during Project construction. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – Under Segment G, there may be direct or indirect effects to San Bernardino ringneck snake, coastal rosy boa, or two-striped garter snake. San Bernardino ringneck snake is expected to have a possibility to occur based on availability of suitable rocky habitat particularly along the western side of San Francisquito Canyon and aquatic habitat in San Francisquito Creek. Coastal rosy boa is expected to be present due to a sighting of an individual by a POWER biologist in 2009, while two-striped garter snake is expected to be likely to occur based on several perennial water stretches in San Francisquito Canyon and Dry Canyon. Construction of new towers and access roads will result in vegetation and habitat loss, and any movement of rocky areas for construction purposes may destroy additional habitat and refuges. Moving rocks may also result in injury or mortality if any snakes are present in between the rocks or on the ground adjacent to them. Excessive disturbance to washes or streambeds may have additional impacts to habitat, as these snake species are attracted to water sources, particularly two-striped garter snake (Stebbins 2003). Disrupting rodents or herpetofauna could also cause reductions in food supply for any snakes that may be in or near the ROW, while displacing snakes into the open may cause increases in predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any snakes in the area, which may get trapped in them. Finally, individuals may be unintentionally run over by construction traffic should they be basking on the ground and undetected.

General practices and mitigation measures protecting riparian habitat and water quality would help to protect areas where these species, particularly the two-striped garter snake, may be found. General practices that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 2a – Under Segment G and Segment 2a there may be direct or indirect effects to San Bernardino ringneck snake, coastal rosy boa, or two-striped garter snake. On Segment G, San Bernardino ringneck snake is expected to have a possibility to occur based on availability of suitable rocky habitat particularly along the western side of San Francisquito Canyon and aquatic habitat in San Francisquito Creek. Coastal rosy boa is expected to be present due to a sighting of an individual by a POWER biologist in 2009, while two-striped garter snake is expected to be likely to occur based on several perennial water stretches in San Francisquito Canyon and Dry Canyon. On Segment 2a, coastal rosy boa is expected to be likely to occur due to a sighting by a POWER biologist during 2009 surveys and availability of chaparral habitat on this segment with a riparian area through the center, while two-striped garter snake is expected to be likely to occur based on availability of a perennial riparian stretch and surrounding chaparral habitat; San Bernardino ringneck snake is not expected to occur. Construction of new towers and access roads will result in vegetation and habitat loss in terrestrial or riparian areas which may be utilized by any of these species. However, due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the snake species from ground disturbance. Figure 7, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction. In addition, movement of rocky areas for construction purposes may destroy additional habitat and refuges and may also result in injury or mortality if any snakes are present in between the rocks or on the ground adjacent to them. Disrupting rodents or herpetofauna could also cause reductions in food supply for any snakes that may be in or near the ROW, while displacing snakes into the open may cause increases in predation.

Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any snakes in the area, which may get trapped in them. Finally, individuals may be unintentionally run over by construction traffic should they be basking on the ground and undetected.

General practices and mitigation measures protecting riparian habitat and water quality would help to protect areas where these species, particularly the two-striped garter snake, may be found. General practices that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 3 – Under Segment I, there may be direct or indirect effects to coastal rosy boa or two-striped garter snake. Coastal rosy boa is expected to be likely to occur due to availability of rocky chaparral habitat on this segment with several riparian areas, while two-striped garter snake is expected to have a possibility of occurring based on several perennial sightings greater than 10 years old within one mile of this segment, the most recent being from 1999 (CDFG 2010). Construction of new towers and access roads will result in vegetation and habitat loss, and any movement of rocky areas for construction purposes may destroy additional habitat and refuges. Moving rocks may also result in injury or mortality if any snakes are present in between the rocks or on the ground adjacent to them. Excessive disturbance to washes or streambeds may have additional impacts to habitat, as these snake species are attracted to water sources, particularly two-striped garter snake(Stebbins 2003), although perennial water sources on Segment I are few, if any. Disrupting rodents or herpetofauna could also cause reductions in food supply for any snakes that may be in or near the ROW, while displacing snakes into the open may cause increases in predation. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any snakes in the area, which may get trapped in them. Finally, individuals may be unintentionally run over by construction traffic should they be basking on the ground and undetected.

General practices and mitigation measures protecting riparian habitat and water quality would help to protect areas where these species, particularly the two-striped garter snake, may be found. General practices that would reduce short- or long-term effects to coastal rosy boa and two-striped garter snake include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to coastal rosy boa and two-striped garter snake include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Reconductoring

The reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake impacts in the preceding section under new 230 kV transmission line Alternatives 2 and 2a. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Under Segment J, there may be direct or indirect effects to coastal rosy boa or two-striped garter snake. Coastal rosy boa is expected to be likely to occur due to availability of suitable vegetative habitat, rocky outcrops, and intermittent streambeds, while two-striped garter snake is expected to have a possibility of occurring based on two individuals identified approximately three miles away by POWER biologists in 2009 combined with a lack of known perennial streambeds under the construction area. Moving rocks may result in injury or mortality if any snakes are present in between the rocks or on the ground adjacent to them. Excessive disturbance to washes or streambeds may have additional impacts to habitat, as these snake species are attracted to water sources, particularly two-striped garter snake (Stebbins 2003). Disrupting rodents or herpetofauna could also cause reductions in food supply for any snakes that may be in or near the ROW, while displacing snakes into the open may cause increases in predation. Finally, individuals may be unintentionally run over by construction traffic should they be basking on the ground and undetected. Potential risks to this species as a result of adding a new 230 kV circuit to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines would pose minimal threat to the San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake. Ground and air monitoring of the lines would not impact potential habitat. Temporary increased dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect these species unless they were present in the road. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Operation and maintenance of the BRRTP would have no effect on the San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake. Potential risks to this species as a result of operation and maintenance of the BRRTP would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake. Operation and maintenance would have **no effect** on the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake.

Alternative 2: The new 230 kV transmission line, reconductoring, the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake. Operation and maintenance would have **no effect** on the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake.

Alternative 2a: The new 230 kV transmission line, reconductoring, the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake. Operation and maintenance would have **no effect** on the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake.

Alternative 3: The new 230 kV transmission line, reconductoring, the new 230 kV circuit **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake. Operation and maintenance would have **no effect** on the San Bernardino ringneck snake, the coastal rosy boa, and the two-striped garter snake.

Coast Horned Lizard

New 230 kV Transmission Line

Alternative 1 – This species, while not considered in the direct construction corridor impacts, nevertheless is expected to be present in the general area. Under Segment D, there would be direct or indirect effects to coast horned lizard which is expected to be present due to numerous sightings within 1.5 miles of the segment, including two of which are within 0.25 mile of the segment's centerline (CDFG 2010). Additionally, a POWER biologist observed a coast horned lizard within 0.10 mile of the proposed ROW on the road along the West Fork of Liebre Gulch in 2010. Tower construction and grading of new or existing access roads would result in habitat and vegetation loss, and may result in direct injury or mortality of individuals. Removal of chaparral for the grading of access roads or tower sites would reduce or degrade suitable habitat for this species. Additionally, any coast horned lizards that go undetected by preconstruction surveys—dictated by mitigation measure BIO-22—and are present under vegetation, on roads, in streambed crossings, or in burrows, may be crushed by foot traffic, vehicles, or heavy equipment. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any coast horned lizards, which may fall into them. It is expected that the risk of falling into an open hole would be greater overnight, as the construction noise and vibrations would be more likely to keep any coast horned lizards from approaching too close to the active site during the day. The construction work may also lead to dispersal of individuals from the area, which could lead to reduced fitness of those individuals if the adjacent habitat is less optimal. This dispersal could also lead to an increased risk of predation or competition if any animals are forced to relocate to unfamiliar territory.

General practices that would reduce short- or long-term effects to coast horned lizard include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to coast horned lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Mitigation Measures for Impacts to Coast Horned Lizard

AIR-2a **Implement construction fugitive dust control plan.** This mitigation measure would require LADWP to prepare and implement a Fugitive Dust Emission Control Plan. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

HYD-1 **Use of Existing Water Crossings.** This mitigation measure would require the Project to use existing access routes as available; to construct new roads by mowing or crushing vegetation to no less than four inches above grade; to keep new roads to a 12-foot maximum width; to use existing crossings at perennial streams, wetlands, and irrigation channels as feasible; and to restore new access roads that would not be used for ongoing maintenance. (Refer to the Mitigation Planning Section of the EIS/EIR [USFS/BLM/LADWP 2011b] for the full text of this mitigation measure)

BIO-1 Provide restoration/compensation for impacted sensitive vegetation communities. This mitigation measure would require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the ANF Land Management Plan. (Refer to Table 2 for the full text of this mitigation measure)

BIO-2 Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way. This mitigation measure would require LADWP to prepare and implement a weed control plan; remove weed seed sources from construction access routes; remove weed seed sources from assembly yards, tower pads, pull sites, landing zones, and spur roads; and use herbicides where necessary to control exotic weeds. (Refer to Table 2 for the full text of this mitigation measure)

BIO-5 Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife. This mitigation measure would require LADWP to conduct preconstruction surveys for special-status species, provide a biological monitor where special-status sign or suitable habitat is identified, and to cover all open trenches or excavations to prevent entrapment of wildlife. (Refer to Table 2 for the full text of this mitigation measure)

BIO-6 Implement a Worker Environmental Awareness Program. This mitigation measure would require a qualified biologist to conduct Worker Environmental Awareness Program (WEAP) training for all crew members. (Refer to Table 2 for the full text of this mitigation measure)

BIO-22 Protect special-status reptile species. This mitigation measure would require LADWP to retain a qualified biological monitor to oversee reptile protection measures during Project construction. (Refer to Table 2 for the full text of this mitigation measure)

Alternative 2 – Under Segment G, there would be direct or indirect effects to coast horned lizard, expected to be present due to numerous sightings within San Francisquito Canyon by POWER biologists in 2009. Tower construction and grading of new or existing access roads would result in habitat and vegetation loss, and may result in direct injury or mortality of individuals. Removal of chaparral for the grading of access roads or tower sites would reduce or degrade suitable habitat for this species. Additionally, any coast horned lizards that go undetected by preconstruction surveys—dictated by mitigation measure BIO-22—and are present under vegetation, on roads, or in burrows, may be crushed by foot traffic, vehicles, or heavy equipment. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any coast horned lizards, which may fall into them. It is expected that the risk of falling into an open hole would be greater overnight, as the construction noise and vibrations would be more likely to keep any coast horned lizards from approaching too close to the active site during the day. The construction work may also lead to dispersal of individuals from the area, potentially leading to an increased risk or predation or competition if any animals are forced to relocate to unfamiliar territory.

General practices that would reduce short- or long-term effects to coast horned lizard include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to coast horned lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 2a – Under Segments G and 2a, there would be direct or indirect effects to coast horned lizard, expected to be present due to several individuals identified within 0.5 mile by POWER in 2009 and 2010. Tower construction and grading of new or existing access roads would result in habitat and vegetation loss, and may result in direct injury or mortality of individuals. Removal of chaparral for the grading of access roads or tower sites would reduce or degrade suitable habitat for this species. Additionally, any coast horned lizards that go undetected by preconstruction surveys—dictated by mitigation measure BIO-22—and are present under vegetation, on roads, or in burrows, may be crushed by foot traffic, vehicles, or heavy equipment. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any coast horned lizards, which may fall into them. It is expected that the risk of falling into an open hole would be greater overnight, as the construction noise and vibrations would be more likely to keep any coast horned lizards from approaching too close to the active site during the day. The construction work may also lead to dispersal of individuals from the area, potentially leading to an increased risk or predation or competition if any animals are forced to relocate to unfamiliar territory

General practices that would reduce short- or long-term effects to coast horned lizard include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to coast horned lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Alternative 3 – Under Segment I, there would be direct or indirect effects to coast horned lizard, expected to be likely to occur due to reported occurrences within two miles of the proposed ROW (CDFG 2010). Tower construction and grading of new or existing access roads would result in habitat and vegetation loss, and may result in direct injury or mortality of individuals. Removal of chaparral for the grading of access roads or tower sites would reduce or degrade suitable habitat for this species. Additionally, any coast horned lizards that go undetected by preconstruction surveys—dictated by mitigation measure BIO-22—and are present under vegetation, on roads, or in burrows, may be crushed by foot traffic, vehicles, or heavy equipment. Furthermore, any excavations that are conducted and left open during the day or overnight would pose a risk to any coast horned lizards, which may fall into them. It is expected that the risk of falling into an open hole would be greater overnight, as the construction noise and vibrations would be more likely to keep any coast horned lizards from approaching too close to the active site during the day. The construction work may also lead to dispersal of individuals from the area, potentially leading to an increased risk or predation or competition if any animals are forced to relocate to unfamiliar territory.

General practices that would reduce short- or long-term effects to coast horned lizard include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to coast horned lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Reconductoring

The reconductoring would occur along Segments A, B, G, and K. Segment G is analyzed in detail for coast horned lizard impacts in the preceding section under new 230 kV transmission line Alternatives 2 and 2a. Potential risks to this species as a result of reconductoring the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

New 230 kV Circuit

Under Segment J, there would be direct or indirect effects to coast horned lizard, expected to be present due to two sightings within 1.5 miles of the proposed ROW (CDFG 2010). Tower construction and grading of new or existing access roads would result in habitat and vegetation loss, and may result in direct injury or mortality of individuals. Removal of chaparral for the grading of access roads or tower sites would reduce or degrade suitable habitat for this species. Additionally, any coast horned lizards that go undetected by preconstruction surveys—dictated by mitigation measure BIO-22—and are present under vegetation, on roads, or in burrows, may be crushed by foot traffic, vehicles, or heavy equipment. The construction work may also lead to dispersal of individuals from the area, potentially leading to an increased risk or predation or competition if any animals are forced to relocate to unfamiliar territory. Potential risks to this species as a result of adding a new 230 kV circuit to the existing transmission line would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Operation and Maintenance

Operation and maintenance of the proposed transmission lines would pose minimal threat to the coast horned lizard. Ground and air monitoring of the lines would not impact potential habitat along Dry Canyon. Temporary increased dust may occur and result in negligible impacts. Occasional road grading in the ROW on access roads and spur roads as required for safe vehicular access would not affect this species unless it were basking in the road and had reduced energy to escape. During emergency operations, temporary disturbance may occur but would be minimized through emergency operation procedures, such as briefing crews on sensitive animal procedures, and minimized operations in sensitive habitats, as conditions permit. Potential risks to this species as a result of operation and maintenance of the Project would be a factor regardless of which alternative is ultimately chosen for construction, as this is a required component of BRRTP.

Effects Determination

Alternative 1: The new 230 kV transmission line, reconductoring, the new 230 kV circuit, and operation and maintenance **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the coast horned lizard.

Alternative 2: The new 230 kV transmission line, reconductoring, the new 230 kV circuit, and operation and maintenance **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the coast horned lizard.

Alternative 2a: The new 230 kV transmission line, reconductoring, the new 230 kV circuit, and operation and maintenance **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the coast horned lizard.

Alternative 3: The new 230 kV transmission line, reconductoring, the new 230 kV circuit, and operation and maintenance **may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for,** the coast horned lizard.

5.0 CUMULATIVE EFFECTS

Cumulative effects would result from incremental impacts of the Proposed Action or its alternatives when added to other past, present, and reasonably foreseeable future actions within the designated region of influence. Cumulative effects for biological resources apply to both plant and wildlife species and must take into account known distribution, availability of preferred habitat, designated critical habitat, local population size, and likely responses to effects for each species that is considered.

Potential cumulative impacts to the environment were addressed that could be associated with the implementation of the Project in conjunction with one or more past, present, or reasonably foreseeable future actions or projects. BLM's NEPA Handbook states that "cumulative impacts can be categorized as additive and interactive. An additive impact emerges from persistent additions from one kind of source whether through time or space. An interactive impact results from more than one kind of source." Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts are most likely to arise when a relationship exists between a proposed alternative and other actions that have, or are expected, to occur in a similar location or time period, or involve similar actions. Projects in close proximity to the Proposed Action and alternatives would be expected to have more potential for cumulative impacts than those more geographically separated.

5.1 IMPACT AREA

The region of influence for BRRTP's biological cumulative effects is defined as any small project within five miles of the proposed segments, as well as any large projects in BRRTP's vicinity (e.g., solar development, wind development) that are farther than five miles from its Project area. This five-mile boundary is assumed to account for impacts to most plants' dispersion area and most animals' migration corridors or individual home ranges.

5.2 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

Because this document only considers impacts to Forest Service Sensitive species, only projects located on the Forest are considered for analysis of cumulative effects below. The list of projects considered in this document includes: 1) Electricity Transmission Projects; 2) Transportation and Public Facilities Projects; and 3) Maintenance/Landscaping Projects.

It is expected that BRRTP's cumulative effects would apply to both special-status plant and wildlife species. These species are listed according to regulations set by the Forest Service. Two sensitive plant species were observed within the ANF, while none were identified on areas surveyed outside the ANF. However, there may be additional sensitive plants within the ANF or outside the ANF that may be affected by BRRTP, including species that were not identified during surveys, or they may occur on lands not surveyed. These species may in turn be affected by other past, present, or future projects such as those described in Chapter 5 of the Draft EIS/EIR, especially those which occur in the ANF (USFS/BLM/LADWP 2011b). Additionally, there is the potential for numerous special-status animals to occur and be affected by BRRTP.

Numerous projects are in various stages of planning and development within the Project vicinity. Below are brief descriptions of those which occur within the ANF and which are either within five miles of the BRRTP or are very large projects (such as the transmission projects).

5.2.1 Transmission Projects

Antelope Transmission Project (ATP) – Construction of Southern California Edison's (SCE's) proposed Antelope Transmission Project is underway and is proceeding in three sequential segments. Construction of Segments 1, 2 and 3A have been completed. Construction of Segment 3B, from Windhub Substation to and including Highwind Substation, has not started and no schedule has been developed by SCE (California Public Utilities – Current Projects).

Segment 3 of the Antelope-Tehachapi Transmission Line consists of two phases. The first phase would involve the construction of a new 26.1-mile 500 kV transmission line between the Antelope Substation and a proposed new substation in the Mojave area (Substation 1). Similar to Segments 1 and 2, this line would be initially energized at 220 kV and upgraded to meet future needs. The second phase would involve the construction of a new 9.4-mile 220 kV transmission line from the proposed Substation 1 to a proposed new substation in the Monolith area (Substation 2).

Tehachapi Renewable Transmission Project (TRTP) – SCE is proposing to construct the TRTP, which would involve new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way in southern Kern County, portions of Los Angeles County including the ANF, and the southwestern portion of San Bernardino County. Stated objectives for the project include providing the electrical facilities necessary to integrate levels of wind generation in excess of 700 MW and up to approximately 4,500 MW in the Tehachapi Wind Resource Area. The environmental review process for the project is currently underway. Construction began in April 2010 on approved sections. Project construction is estimated to completed in 2015. The project is composed of Segments 4 through 11; however, only Segments 4, 5, and 10 are located within the Project area.

Segment 4 would consist of constructing two new single-circuit 220 kV transmission lines within four miles of new ROW between the Cottonwood Substation and proposed Whirlwind Substation. SCE also proposes construction of a new single-circuit 500 kV transmission line within 16 miles of new ROW between the Antelope Substation and proposed Whirlwind Substation.

Olive – Power Plant 1/Power Plant 2 Transmission Line Replacement – LADWP is removing 18 steel towers and conductor and replacing them with 11 larger towers and conductor to comply with mandatory standards for reliability and safety of power lines. This project is located in San Francisquito Canyon and includes transmission towers spanning a portion of the area between LADWP's Power Plant 1 (PP1) and Power Plant 2 (PP2). Construction was scheduled to begin in November 2011 (USFS 2012).

5.2.2 Transportation and Public Facilities

Pacific Pipeline Storm Relocation Project and Access Road Repairs – Pacific Pipeline is proposing to relocate several miles of crude oil pipeline to more stable ground within the ANF (USFS 2011).

Old Ridge Route Storm Damage Repairs – The ANF is proposing to repair and maintain seven locations along the length of the Old Ridge Route from West Oakdale Canyon Road to Templin Highway. The road has been damaged by several years of rain damage (USFS 2011).

LA County Templin Highway and Drainage Project at MM 3.80 – The Los Angeles Department of Public Works is proposing to repair a damaged section of Templin Highway overlooking Castaic Creek. This operation would also involve repairing and improving the catch basin and drainage system at this location (USFS 2011).

5.2.3 Maintenance and Landscape Management Projects

Black Oak Mistletoe Project – The Forest Service is proposing to restore stands of black oaks along Forest Road 7N23 by managing the mistletoe infestation in the area. Several eradication techniques will be used. Understory planting will also occur to help promote native restoration (USFS 2011).

Buffer OHV Restoration Project – The Forest Service is proposing to restore areas in the vicinity of Texas Canyon and Rowher Canyon that have been previously damaged by unauthorized OHV use. Botanical, wildlife, and archaeological surveys in the area have not been completed (USFS 2011).

Elizabeth Tunnel Repair Project – In fall of 2009, LADWP repaired the entrance to the Elizabeth Tunnel in South Portal Canyon. This consisted of digging up sediment that had slid off the entrance to the tunnel, which is normally concealed by a dirt wall, and replacing it at the tunnel's entrance.

Jupiter Fuelbreak Project – The Forest Service proposes to re-establish an existing fuel break that begins southwest of the unincorporated community of Green Valley and travels east, bisecting Jupiter Mountain, before heading south to Bouquet Reservoir.

Lake Hughes Plantation Restoration Project – The proposed project would restore unauthorized off-highway vehicle trails at the Christian and Taylor Plantations located within the ANF in order to reduce soil erosion, the spread of weeds, destruction of native plants, soil compaction, and wildlife habitat loss. Proposed actions include recontouring and decompacting soils, reseeding with native species, and reinforcing check dams. The project was approved by the District Ranger in 2009 and scheduled for implementation in January 2010 (USFS 2011).

Littlerock Recreation Area – The proposed project would reopen Little Rock Creek Road (Forest Road 5N04) to non-motorized and motorized vehicle use, including OHVs, as well as reopen Alimony Truck Trail (Forest Road 4N15) to non-motorized and street-legal motorized vehicles only. It would also reopen a portion of the current closure area within the Littlerock Recreation Area. Forest Road 5N04 runs alongside Little Rock Creek, while Forest Road 4N15 runs alongside an unnamed intermittent creek. A decision was expected in April 2012 and implementation was expected for May (USFS 2012).

Pelona OHV Restoration Project – The Forest Service is proposing to restore areas in the vicinity of Bouquet Canyon that have been previously damaged by unauthorized OHV use. Botanical, wildlife, and archaeological surveys in the area have not been completed (USFS 2011).

Portal Ridge Restoration Project – The Forest Service is proposing to place barriers along Portal Ridge to restrict unauthorized vehicle access. In addition, compacted soil would become scarified to promote plant growth and signs would be installed to dissuade the public from trespassing (USFS 2011).

Power Plant 2 Tailings Removal Project – In spring and summer 2009, LADWP removed tailings material—left from the aqueduct construction—from the hillside above Power Plant 2. The material was lifted off the hillside and deposited in two fill sites located on the ridge in areas that were not at risk of eroding. Slender mariposa lily was present on-site and removed for the duration of construction.

San Francisquito/Bouquet Creek Weed Removal Project – In 2010, the Forest Service removed invasive weeds along approximately 2.5 miles of stream in the San Francisquito and Bouquet Creek watersheds. This habitat was suitable for the Forest Service Sensitive species arroyo chub (USFS 2010).

Santa Clara/Mojave Rivers Ranger District Fuelbreak Re-establishment Project – The proposed project would re-establish existing Castaic, Cordova, Elderberry, and Necktie district fuelbreaks. Chainsaw, prescribed burning, discing, and masticating will be used to re-establish the breaks. This was expected to begin in February 2011 (USFS 2012).

Santa Clara/Mojave Rivers Ranger District Plantation Maintenance Project – The proposed project would consist of vegetation maintenance at 13 plantations located within the ANF in order to reduce wildfire risk, and improve wildlife habitat and the vitality of individual remaining trees. Proposed actions include removal of dead trees, thinning of live trees, pruning, removing weeds, and planting for reforestation where necessary. This action was approved by the District Ranger in January 2010 (USFS 2011).

Santa Clara River Watershed Invasive Plant Treatment Project – The Forest Service is proposing to eradicate, control, contain, and/or suppress existing and new infestations of invasive plant species in the Santa Clara/Mojave River Watershed by the use of herbicides, manual, mechanical, biological, and fire methods (USFS 2011).

Sawmill Liebre Forest Health Project 2010 – The proposed project consists of pruning lower branches, removing competing brush, opening canopy covers, clearing a perimeter fuelbreak, and replanting trees at six forestry plantations. These plantations are primarily located along the Liebre Mountain Ridge, located between the Old Ridge Route and Lake Hughes. A decision was expected in April 2012 and implementation was expected to begin in May 2012 (USFS 2012).

South Portal Restoration Project – The Forest Service is proposing to place barriers along Forest Road 7N02 in South Portal Canyon to restrict unauthorized vehicle access. In addition, compacted soil would become scarified to promote plant growth and signs would be installed to dissuade the public from trespassing (USFS 2011).

Tule Ridge/South Portal Fuels Reduction Project – The Forest Service proposes fuels reduction and re-establishment of a fuel break to provide protection to unincorporated community of Green Valley. The project would also enhance wildlife for mammals and birds (USFS 2011).

5.3 DIRECT AND INDIRECT IMPACTS SUMMARY

Both direct and indirect impacts are expected to occur to vegetation and wildlife. Direct impacts are defined as those that occur at the same time and place as BRRTP or the surrounding projects described in Section 4.2. Indirect impacts are defined as those which could be caused by BRRTP or surrounding projects, but which would occur at a later time or occur at a distance farther removed from the direct construction corridor. While all of the direct and indirect impacts below could possibly occur due to BRRTP, not all may necessarily apply to each project listed in Section 4.2. However, any common direct or indirect impacts between BRRTP and any of the above-listed projects would exert cumulative effects of varying degrees on certain species or groups of species.

Direct Impacts

- Habitat loss, fragmentation, or degradation (short-term and long-term);
- Direct injury or mortality;
- Disturbance of special-status plants or animals (dust deposition on or crushing of plants, disturbance of an animal's daily activities or natural history); and
- Dispersal of local wildlife (including mortality of young for nesting wildlife).

Indirect Impacts

- Habitat degradation (spread of non-native plant species, soil compaction);
- Indirect injury or mortality (dispersal leading to increased predation risk and/or competition, ingestion of construction debris);

- Disturbance of special-status plants (loss of plant vigor due to dust or mud deposition);
- Reduction in water quality due to insufficient erosion control; and
- Avian collisions and/or electrocutions.

5.4 CUMULATIVE EFFECTS EVALUATION

Cumulative effects are evaluated below for each listed species that may be affected by BRRTP and surrounding projects.

Slender Mariposa Lily (*Calochortus clavatus var. gracilis*) – The Forest Service sensitive slender mariposa lily has been identified on all Alternatives. Cumulative effects may be projected onto this species with the combined influence of BRRTP and the Pacific Pipeline Storm Relocation Project on Alternative 1 and LADWP's Power Plant Two (PP2) Tailings Removal Project, the Santa Clara/Mojave Rivers Ranger District Plantation Maintenance Project, SCE's Antelope Transmission Project (ATP), and SCE's Tehachapi Renewable Transmission Project (TRTP) on Alternatives 2, 2a and 3. In addition, there are several maintenance projects in the Project's vicinity in the ANF which may contribute to cumulative effects on this species. The Pacific Pipeline Storm Relocation Project, located east of Alternative 1, will relocate several miles of crude oil lines to different locations and will likely result in some habitat loss to this species, although the specific amount is unknown (USFS 2011). It is unknown if this will impact the approximately one dozen individuals that were identified on Alternative 1 during BRRTP botanical surveys (POWER 2010c), but would still result in a loss of habitat. LADWP's PP2 Tailings Removal Project, located west of Alternatives 2 and 2a, resulted in the removal of approximately 150 individual slender mariposa lilies from its project area. However, while approximately 2,400 individuals and nearly 1,700 individuals—with some overlap—were located on Alternative 2 during BRRTP botanical surveys in 2008 and 2009, respectively (POWER 2008b, POWER 2010c), none of these were part of the individuals removed during the PP2 Tailings Removal Project. Two of the plantations—Hollow Tree and Artesian Springs—that recently underwent vegetation and habitat management had over 100 impacted slender mariposa lilies located at each (K. VinZant personal communication 2011). Approximately 5,000 slender mariposa lilies, as well as several acres of suitable habitat, were impacted by SCE's ATP, located in between Alternatives 1 and 2/2a. Surveyors located 420 individuals on Alternative 3 during BRRTP botanical surveys, and would be impacted by habitat loss and degradation if not also individual removal, depending on specific plant locations (POWER 2008b). The effects from these three projects would exert a cumulative effect with BRRTP on slender mariposa lily by reducing the overall local population and also removing and degrading appropriate habitat. SCE's TRTP, located east and southeast of BRRTP, estimated that it was unlikely for slender mariposa lily to be present within TRTP Segments 4 and 5, but that individuals could possibly be present on Segments 6 and 11 due to nearby populations (Aspen 2009). Both of the latter TRTP segments are located within the ANF south of California SR 14. Loss of individuals or of habitat in these areas would exert a cumulative effect with BRRTP on slender mariposa lily by reducing the overall regional population and/or habitat.

Several other projects are located in the vicinity of the BRRTP in the ANF. While the Elizabeth Tunnel repair project conducted in fall 2009 was in an area surrounded by chaparral vegetation, the specific project work resulted in little, if any, impact to the chaparral on the slopes. The weed removal within San Francisquito and Bouquet Creeks by Forest Service staff had no effect on slender mariposa lily because there was no suitable habitat for it within the project area. The Jupiter Fuelbreak Project, Sawmill Liebre Forest Health Project, and Tule Ridge/South Portal Fuels Reduction Project may result in loss of habitat for this species in the areas where vegetation is cleared. The Olive-PP1/PP2 project may affect individual plants, which were identified in this area during focused botanical surveys conducted for the BRRTP. However, POWER installed carsonite posts near areas where this species was detected to alert the construction crew of their presence for avoidance. Some projects, like the Black Oak Mistletoe Project, Buffer OHV Restoration Project, Pelona OHV Restoration Project, Portal Ridge Restoration Project, and

South Portal Restoration Project may benefit the slender mariposa lily by directly improving habitat conditions or by indirectly improving habitat conditions by restricting human access.

Effects from BRRTP would be minimized by the implementation of mitigation measures BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat). Cumulative effects on slender mariposa lily between BRRTP and past, present, and foreseeable projects would be significant.

Short-joint Beavertail (*Opuntia basilaris var. brachyclada*) – The Forest Service and BLM sensitive short-joint beavertail has been identified on all Alternatives. Cumulative effects may be projected onto known populations of this species with the combined influence of BRRTP and the Pacific Pipeline Storm Relocation Project on Alternative 1 and LADWP's PP2 Tailings Removal Project, SCE's ATP, and SCE's TRTP on Alternative 2, 2a and 3. The Pacific Pipeline Storm Relocation Project, located east of Alternative 1, will relocate several miles of crude oil lines to different locations and will likely result in some habitat loss to this species, although the specific amount is unknown (USFS 2011). It is unknown if this will impact the 49 individuals that were identified on Alternative 1 during BRRTP botanical surveys (POWER 2010c), but it would still result in a loss of habitat. LADWP's PP2 Tailings Removal Project, located west of Alternatives 2 and 2a, did not have any identified individuals of this species, although suitable habitat was removed during the project. During 2008 and 2009 BRRTP botanical surveys, 84 short-joint beavertail individuals were identified along Alternatives 2 and 2a (POWER 2008b, POWER 2010c) which would likely be affected by BRRTP construction, resulting in a combined effect of habitat loss in both areas. No short-joint beavertails were located during botanical surveys for SCE's ATP (LSA 2007e, LSA 2007f, LSA 2007g), but appropriate habitat for this species was impacted during construction. Five individuals were located on Alternative 3 during BRRTP botanical surveys, and would be impacted by habitat loss and degradation if not also individual removal, depending on specific plant locations (POWER 2008b). SCE's TRTP, located east and southeast of BRRTP, estimated that it was likely for short-joint beavertail to be present within TRTP Segment 5, and that individuals are present on Segments 6 and 11 (Aspen 2009). TRTP Segment 5 originates in the southern section of ANF and runs adjacent to Alternative 3; TRTP Segments 6 and 11 are located within the southern section of ANF. Loss of individuals or of habitat in any of these areas would exert a cumulative effect with BRRTP on short-joint beavertail by reducing the overall local and regional population and/or habitat.

Some additional projects are located in the vicinity of the BRRTP. While the Elizabeth Tunnel repair project conducted in fall 2009 was in an area surrounded by chaparral vegetation, the specific project work resulted in little, if any, impact to the chaparral on the slopes. The weed removal within San Francisquito and Bouquet Creeks by Forest Service staff had no effect on short-joint beavertail because there was no suitable habitat for it within the project area. The Jupiter Fuelbreak Project, Sawmill Liebre Forest Health Project, and Tule Ridge/South Portal Fuels Reduction Project may result in loss of habitat for this species in the areas where vegetation is cleared. The Olive-PP1/PP2 project may remove suitable habitat for this species in the process of replacing the existing towers; however, this species was not detected in this area during focused botanical surveys conducted for the BRRTP. Some projects, like the Black Oak Mistletoe Project, Buffer OHV Restoration Project, Pelona OHV Restoration Project, Portal Ridge Restoration Project, and South Portal Restoration Project may benefit the short-joint beavertail by directly improving habitat conditions or by indirectly improving habitat conditions by restricting human access.

While no botanical surveys were conducted on new 230 kV circuit corridor and reconductoring corridor south of Haskell Canyon, there may be existing habitat for or individuals of this species on these corridors. Effects from BRRTP would be minimized by the implementation of mitigation measures BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat). Cumulative effects on short-joint beavertail between BRRTP and past, present, and foreseeable projects would not be significant if properly mitigated.

Other Sensitive Plant Species – There are many Forest Service Sensitive plant species that may occur in the BRRTP area, only two (slender mariposa lily and short-joint beavertail) of which were identified during 2008, 2009, and 2010 botanical surveys. The Sensitive plant species that may occur in the Project area are described in Table 5 for each Alternative and segment. Large populations or many scattered individuals of sensitive plant species may have gone undetected in the limited surveys that were conducted. Direct impacts that may occur to these species include habitat loss and degradation due to construction activities and disturbance due to dust deposition or crushing (but not removal) of vegetation. Dust deposition may lead to reduced plant vigor if the plants are unable to sufficiently photosynthesize. Indirect impacts to this species include soil compaction from excessive activity and spread of non-native weed species as a result of seeds stuck to vehicles. Soil compaction may prevent sufficient water from reaching the roots of plants, which can lead to mortality or a reduction in vigor of the plant. Non-native weed species tend to follow disturbance and can spread through vehicle tires or be carried by the wind from nearby established populations. With the amount of disturbance that may occur with this Project where new roads or tower sites are created, there could be a potentially large amount of non-native weed seeds spreading into bare or disturbed areas. Surrounding projects, whether large or small, result in some quantity of habitat loss and/or spread of non-native weeds, which in turn makes it difficult for native plants to establish and can affect whole habitats.

There are several transmission line, wind, or solar energy projects within the BRRTP vicinity along the ANF, Antelope Valley, and Mojave Desert. These include the Beacon Solar Energy Project, Pine Canyon Wind Project, Pine Tree Solar Project, Windstar Wind Energy Project, Alta-Oak Creek Mojave Project, PdV Wind Energy Project, AV Solar Ranch One, TRTP, ATP, and various parcels of land for which the BLM has applied to develop for wind or solar generation. Additional projects in the BRRTP area include the Antelope Valley Water Bank Project, the California High Speed Rail, the construction of the community of Centennial, the Pacific Pipeline Storm Relocation, the ongoing Castaic Power Plant Sediment Removal, the PP2 Tailings Removal Project, the Elizabeth Tunnel repair, the Tule Ridge, Green Valley, and Leona Divide Fuelbreaks, the Hollow Tree and Artesian Springs Tree Plantation Fuel Removal projects, the Bouquet Creek Weed Removal Project, and the Grapevine Creek Streambed Diversion Project. All of these projects have or will result in vegetation loss and, although efforts are made to identify special-status plant species for avoidance before construction begins, some individuals may have been or may be missed, resulting in individual losses. It is not expected that any of these individual projects will lead to a change in listing status of any of these plants, but considered cumulatively they may be more significantly affected in local or regional populations of species.

Effects from BRRTP would be minimized by the implementation of mitigation measures BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-13 (Protect special-status plant species and their habitat). However, large populations or many scattered individuals of sensitive plant species may have gone undetected in the limited surveys that were conducted along all the Alternatives, especially in more dense or inaccessible chaparral. Therefore, cumulative effects on special-status plant species between BRRTP and past, present, and foreseeable projects may be significant.

Swainson's Hawk (*Buteo swainsonii*) – The Forest Service Sensitive and State Threatened Swainson's hawk has the potential to occur in the BRRTP area as part of its winter range or as part of a flyover on its way to South America. It was observed during surveys on Segment G in 2009 and could also occur throughout the BRRTP area within the Antelope Valley. It is unlikely that any direct injury or mortality would occur to this species as a result of BRRTP, as Swainson's hawk is not believed to be present in the area during breeding season. However, habitat loss will occur as grassland and agricultural areas are bladed to construct access roads and tower sites. This may have an effect on foraging capabilities. New transmission towers will pose a risk of electrocution and collision if not properly designed and mitigated. There are no projects in the vicinity of Segment G that would affect Swainson's hawk except for SCE's Antelope-Pardee 500 kV Transmission Line Project. This project was estimated to have approximately 315 acres of suitable foraging habitat within the ANF that could be affected, but it was determined that due to foraging travel distances and overall regional habitat suitability, effects on habitat from project implementation would be limited (Aspen 2006). SCE also estimated that implementation of prescribed transmission tower designs as described by APLIC (2006) would prevent bird—including raptor—electrocutions and that bird collisions would not substantially increase from pre-project conditions (Aspen 2006). During construction, five active Swainson's hawk nests were detected in the vicinity of the new transmission line (Aspen 2009). The Olive/PP1-PP2 project may affect flight patterns or perching opportunities for Swainson's hawk by replacing 18 smaller towers with 11 larger towers, thereby increasing tower size and span length. In addition, various projects on the ANF to establish or restore firebreaks or to revegetate disturbed areas may negatively or positively affect Swainson's hawk foraging habitat, respectively. These include projects such as the Jupiter Fuelbreak Project; the Pelona OHV, Portal Ridge, and South Portal Restoration Projects; the Santa Clara/Mojave Rivers Ranger District Plantation Maintenance Project; the Santa Clara/Mojave Rivers Ranger District Fuelbreak Re-establishment Project; the Sawmill Liebre Forest Health Project; and the Tule Ridge/South Portal Fuels Reduction Project. Because several of these projects are in close proximity to the proposed BRRTP ROW, particularly Alternative 2a, there would be a cumulative loss of habitat where habitat is being removed or degraded for multiple projects. General practices and mitigation measures to protect Swainson's hawk would be implemented during construction of the BRRTP. General practices that would reduce short-term or long-term effects to Swainson's hawk include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to Swainson's hawk include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-11 (Reduce avian collisions with and electrocutions on transmission lines).

Peregrine Falcon (*Falco peregrinus*) – The Forest Service Watch List and State Endangered peregrine falcon is not known to occur in the BRRTP area, but has the potential to occur along several segments in the ANF due to habitat availability, although nesting habitat may be limited by a lack of cliff-type areas. Because its habitat is primarily located in riparian areas, there will likely only be a small amount of habitat loss from BRRTP, as riparian areas and water bodies will be impacted as minimally as possible. The Antelope-Pardee 500 kV Transmission Project also identified a potential for peregrine falcon to occur, although it also cited a lack of nesting habitat. Based on the alignment for the Antelope-Pardee transmission corridor, impacts to peregrine falcon habitat were likely negligible, as riparian habitat is scarce. Peregrine falcon was identified as present or possibly present on several segments of the TRTP, mainly as migrants. Construction in these areas may result in habitat loss depending on where the habitat is located in relation to construction plans. However, peregrine falcon has a very large yearlong range covering almost all of the California coast and about half of the eastern side of California, and a winter range covering most of California's interior (CDFG 2008), and therefore will likely be largely unaffected by the relatively small amounts of habitat that will be lost around these project areas. Construction of all three of these transmission projects may benefit peregrine falcon by providing roosting sites or nesting sites on the towers, but at the same time may increase the risk to the species—as with all raptors—of collision, which will require appropriate mitigation and tower designs. The Olive/PP1-PP2 project may affect flight patterns for peregrine falcons by replacing 18 smaller towers with 11 larger towers, thereby increasing tower size and span length. Plans by the Forest Service to remove weeds and restore riparian habitat in the ANF may improve habitat for this species if suitable cliff habitat is present nearby for nesting. This would include projects such as the Santa Clara River Watershed Invasive Plant Treatment Project. Effects to riparian areas from the BRRTP may cause cumulative impacts with these projects where riparian habitat is being affected. In some cases the net change may be positive where habitat is being greatly improved. However, suitable cliff habitat is not in abundance in the riparian areas that are within or adjacent to the BRRTP. General practices and mitigation measures to protect peregrine falcon would be implemented during construction of the BRRTP. General practices that would reduce short-term or long-term effects to peregrine falcon include GP-8, GP-24, GP-40, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to peregrine falcon include BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-11 (Reduce avian collisions with and electrocutions on transmission lines).

Bald Eagle (*Haliaeetus leucocephalus*) – The Forest Service sensitive and State Endangered bald eagle has the potential to occur near BRRTP Segments D and J, where there is a large, open body of water at Castaic Reservoir. Direct impacts to this species include habitat loss for construction of access roads and tower sites, as well as disruption from construction. Indirect impacts may include increased risk of electrocution and collision with transmission towers unless properly designed and mitigated. Overall impacts to bald eagle from BRRTP will be small due to the overall lack of suitable habitat in the Project area, the general lack of sightings on ANF, and the degree of existing disturbance such as at the Castaic Lake State Recreation Area. No impacts from SCE's Antelope-Pardee 500 kV Transmission Line Project were expected and this species was not described in detail in project documents (Aspen 2006). Long-term impacts from SCE's TRTP include increased risk of electrocution and collision as a result of new transmission lines; however, towers and lines for TRTP will be designed and constructed according to raptor-safety guidelines suggested by APLIC (2006). Numerous other projects are located near Segments D and J, including the Pacific Pipeline Storm Relocation, LADWP's Castaic Power Plant Sediment Removal Project, LADWP's PP2 Tailings Removal Project, the Old Ridge Route Storm Damage Repairs, the LA County Templin Highway and Drainage Project, and Forest Service Bouquet and San Francisquito Creeks weed removal efforts. However, none of these projects is in an area of suitable habitat for the bald eagle. The Pacific Pipeline Storm Relocation will be in areas near to the proposed Segment D centerline, but would not affect flight patterns or any available nesting habitat for the bald eagle. The Sawmill Liebre Forest Health Project could, over time, benefit bald eagles by replanting trees at forest plantations located between the Old Ridge Route and Lake Hughes, especially at plantations located closer to Lake Hughes. If the trees eventually grow large, they could provide new nesting opportunities for bald eagles. No other projects in the BRRTP vicinity are expected to impact the bald eagle based on the general lack of suitable habitat and lack of projects in areas which are in suitable habitat. Cumulative effects would therefore likely be low. General practices and mitigation measures to protect bald eagle would be implemented during construction of the BRRTP. General practices that would reduce short-term or long-term effects to bald eagle include GP-8, GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short-term or long-term effects to bald eagle include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-17 (Protect the bald eagle and golden eagle).

California Spotted Owl – The Forest Service Sensitive, BLM Sensitive, and CDFG Species of Special Concern California spotted owl has a possibility of occurring on Alternatives 2 and 2a and is unlikely to occur on Alternative 1. It is possible that there would be degradation or loss of habitat for this species where trees are required to be trimmed or possibly removed, and that construction activities both in trees or around tower or access road construction areas may lead to owls becoming injured, killed, or vacating the areas temporarily or permanently. The California spotted owl was estimated to have a moderate potential to occur within the project area for SCE's ATP, with possible effects ranging from removal of habitat for nesting birds to abandonment due to construction presence to loss of foraging habitat (Aspen 2006). SCE's TRTP is expected to affect 43 acres of montane conifer forest (California spotted owl habitat) on Alternative 2 and 36 acres on Alternative 6; the species is expected to be present on Alternatives 6 and 11 (Aspen 2009). More specific effects from TRTP include direct removal of possible nest trees and foraging areas, noise from humans and construction, vehicle access through the project area, spread of invasive weeds, degradation of habitat, and increased recreational use. The Forest Service's Black Oak Mistletoe Project may benefit California spotted owls if any individuals or pairs utilize the areas that will be improved. Effects from SCE's projects may cause negative cumulative effects with the BRRTP, but Forest Service habitat improvement projects may offset some of these by improving habitat for this species in other areas. The Sawmill Liebre Forest Health Project could, over time, benefit California spotted owl by replanting trees at forest plantations located between the Old Ridge Route and Lake Hughes. If the trees eventually grow large, they could provide new nesting opportunities for spotted owls. General practices and mitigation measures to protect California spotted owl would be implemented during construction of the BRRTP. General practices that would reduce short-term or long-term effects to California spotted owl include GP-8, GP-24, GP-25, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short-term or long-term effects to California spotted owl include BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), BIO-11 (Reduce avian collisions with and electrocutions on transmission lines), and BIO-19 (Protect California spotted owl).

Bat Species – The special-status bat species pallid bat, Townsend's big-eared bat, and western red bat are all likely to occur on all Project alternatives. Western red bat is likely to occur on Segment J as well, while pallid bat and Townsend's big-eared bat could possibly occur on this component. These species will possibly be affected by the construction of BRRTP that may occur in the vicinity of roosting habitat, such as rocky areas or buildings and structures, or foraging habitat such as riparian zones or grassy or shrubby areas. Potential effects from the BRRTP include injury, mortality, habitat loss or degradation, disruption of foraging or roosting, and abandonment of colonies. Previous development and recreation in and around the ANF has degraded and removed habitat for these species. SCE's TRTP is expected to also have an effect on bats roosting near transmission towers and possibly on roosting colonies if present and undetected, although TRTP's mitigation measures will require detected colonies to be flagged and avoided (Aspen 2009). Other future habitat restoration projects such as the Buffer OHV, Pelona OHV, Portal Ridge, and South Portal Restoration Projects may benefit these species if they result in an increase in shrubby foraging habitat. Projects such as the Santa Clara River Watershed Invasive Plant Treatment Project will improve existing riparian habitat that may benefit these species, particularly the western red bat which utilizes riparian zones (Reid 2006). However, fuelbreak reestablishment projects combined with increasing urbanization, development, and recreational use may degrade or remove areas used by these species. General practices and mitigation measures to protect sensitive bat species would be implemented during construction of the BRRTP. General practices that would reduce short- or long-term effects to special-status bat species include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, GP-49, and GP-56. Mitigation measures that would reduce short- or long-term effects to special-status bat species include HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-21 (Protect sensitive bat species).

Tehachapi Pocket Mouse – The Forest Service Sensitive and CDFG Species of Special Concern Tehachapi pocket mouse could possibly occur on Alternatives 2, 2a, and the reconductoring component. It is unlikely to occur on Alternative 1. Potential effects as result of construction of the BRRTP include injury or death, crushing of burrows, or disruption if it is awakened by construction noise and disturbance. Areas of historical occurrences, such as Elizabeth Lake, have been developed. This species had a moderate potential to occur within the footprint of SCE's ATP, which resulted in the permanent loss of suitable habitat due to tower placement (Aspen 2006). Future fuelbreak or restoration activities within the ANF may negatively or positively impact this species should they be in suitable arid grassy or shrubby habitat. General practices and mitigation measures to protect Tehachapi pocket mouse would be implemented during construction of the BRRTP. General practices that would reduce short- or long-term effects to Tehachapi pocket mouse include GP-24, GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to Tehachapi pocket mouse include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-20 (Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox).

Arroyo Chub – The Forest Service Sensitive and CDFG Species of Special Concern arroyo chub could possibly occur on Alternatives 2 and 2a, the reconductoring component, and Segment J. Potential effects as a result of construction of the BRRTP include crushing and habitat degradation, including spread of non-native weed species, accidental spills of vehicular fluids into waterways, and destruction of breeding and spawning habitat. Similar effects are expected from the construction of SCE's TRTP, where arroyo chub is known to be present within several project segments (Aspen 2009, Aspen 2010). While suitable habitat for the arroyo chub is present within areas that were part of the San Francisquito/Bouquet Creek Weed Removal Project, it was estimated that there were no effects to the species because the work conducted in these areas did not affect the stream or water quality (USFS 2010). While little information is currently available, based on the short summaries that are available within the USFS Schedule of Proposed Actions (USFS 2011), the Santa Clara River Watershed Invasive Plant Treatment Project could have the potential to affect arroyo chub by improving its habitat conditions, depending on the locations and methodology of the treatment. Future projects that occur within San Francisquito Creek or other areas of suitable habitat or known arroyo chub occurrences would also have the potential to influence this species, negatively or positively. The Littlerock Recreation Area reopening would not be expected to affect this species, as it is not known to occur in this area. General practices that would reduce short-term and long-term effects to arroyo chub and its habitat include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to arroyo chub and its habitat include HYD-01 (Use of Existing Water Crossings), HYD-02 (New Road Construction Over Waterways), BIO-2 (Prevent the spread of invasive weeds), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), and BIO-6 (Implement a Worker Environmental Awareness Program).

California Legless Lizard – The Forest Service Sensitive and CDFG Species of Special Concern California legless lizard could possibly occur on Alternative 3 and on Segment J and is unlikely to occur on all other Project alternatives and components. Potential effects as a result of the construction of the

BRRTP include injury or mortality to individuals which may be hiding or foraging under leaf litter or other cover, as well as habitat degradation or loss in chaparral or riparian areas. This species had a high likelihood to occur in SCE's ATP (Aspen 2006) and is likely to occur or present on several alternatives of SCE's TRTP (Aspen 2009); however, impacts to this specific species are not analyzed for either of these projects. Future activities that remove trees would reduce the amount of leaf litter for this species, which it uses to forage under and keep cool, and those which affect riparian areas may degrade habitat that this species uses for moisture, but activities which may improve arboreal habitat or improve riparian areas may benefit it. General practices and mitigation measures to protect California legless lizard would be implemented during construction of the BRRTP. General practices which would reduce short-term or long-term effects to California legless lizard include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short-term or long-term effects to California legless lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Southwestern Pond Turtle – The Forest Service Sensitive and CDFG Species of Special Concern southwestern pond turtle is expected to be present on Alternatives 2 and 2a and the reconductoring component. However, there is little habitat that could support this species along these portions of the Project, and no turtles were documented in the areas of suitable habitat—namely, Drinkwater Flat—during Project surveys. Habitat may be degraded in these areas as a result of construction and vehicle activity, and individual turtles, if present, could be harmed if undetected. LADWP's Castaic Power Plant Sediment Removal Project occurred in an area of Castaic Creek where 17 southwestern pond turtles were detected and relocated upstream and out of the project area. If these turtles return to the same area they were found, they may continue to be disturbed, relocated, or even injured or killed during future sediment removal efforts, as the project was part of an ongoing maintenance operation at Castaic Power Plant. It is unknown how large the population was and if it exceeded 17 individuals at the time of construction. These individuals are expected to be extant and in the general area, although it is unknown if they survived the relocation and overwintered at their new locations or if any individuals were preyed upon or unable to adapt. It is unlikely that they would migrate up to the BRRTP ROW or be affected by BRRTP construction given the numerous obstacles between the Project and Castaic Creek. However, any impacts to this population in the future would impact the same local population that BRRTP could impact in the unlikely scenario that BRRTP construction impacts southwestern pond turtles along Segment J. This species is also expected to be present or likely to occur in numerous segments of SCE's TRTP (Aspen 2010). It is expected that many southwestern pond turtles were killed due to the Station Fire in 2009, and that any effects from TRTP to this species may be magnified at a greater level due to their assumed depressed numbers in the area. Possible effects to southwestern pond turtle from TRTP include crushing; loss of nesting, basking, or breeding sites; trampling; degraded habitat quality possibly resulting in loss of food sources if water is degraded; loss of habitat; disruption of breeding; and spread of non-native weeds. Any impacts to this population during construction, operation, or maintenance would impact the regional population, but not the same local populations that may be affected by BRRTP, as TRTP crosses the southern portion of the ANF opposite SR-14 from BRRTP.

Non-native plant removal operations such as the San Francisquito/Bouquet Creek Weed Removal Project and the Santa Clara River Watershed Invasive Plant Treatment Project will improve riparian habitat which may benefit this species if it is in areas that could support southwestern pond turtles, which are known to occur in San Francisquito Creek. General practices and mitigation measures to protect southwestern pond turtle would be implemented during construction of the BRRTP. General practices that would reduce short- and long-term effects to southwestern pond turtle include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to southwestern pond turtle include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Snake Species – The Forest Service Sensitive San Bernardino ringneck snake could possibly occur on Alternatives 2, 2a, and the reconductoring component. The Forest Service and BLM Sensitive coastal rosy boa is known to be present within Alternatives 2, 2a, and the reconductoring component and is likely to occur on Alternatives 1, 3, and Segment J. The Forest Service and BLM Sensitive and CDFG Species of Special Concern two-striped garter snake is likely to occur on Alternatives 2, 2a, and the reconductoring component and could possibly occur on Alternative 3 and Segment J. The San Bernardino ringneck snake and coastal rosy boa both had moderate potential to occur within the project area for SCE's ATP and could have suffered impacts during its construction (Aspen 2006). Two-striped garter snake had a high potential to occur in the project area, particularly in the Bouquet Creek area close to BRRTP, and individuals may have been crushed or disrupted during daily activities; additionally, riparian habitat could have been lost or degraded during construction or vehicle passage. All three species are present or likely to occur in portions of SCE's TRTP (Aspen 2009) and could be injured or killed during TRTP's construction, as well as having a decrease in suitable habitat due to construction areas, soil compaction, vegetation removal, and spread of non-native plant species. This would affect regional populations of these species given the distance between the two project areas.

Maintenance and management projects on the ANF have the potential to improve habitat quality for these species where riparian habitat is present. Non-native plant removal projects such as the San Francisquito/Bouquet Creek Weed Removal Project and the Santa Clara River Watershed Invasive Plant Treatment Project can benefit all three species, as all three will utilize riparian areas. Many of the other terrestrial management projects such as fuelbreaks and restorations may have slight effects on these species, but are probably unlikely to cause significant changes to suitable habitat for any of them, as their most common habitat elements include water and rocky areas. The Littlerock Recreation Area project may affect these species if they are crossing the road. The two-striped garter snake is known to be present in Little Rock Creek and may frequent areas near the reopened roads. General practices and mitigation measures to protect these snake species would be implemented during construction of the BRRTP. General practices and mitigation measures protecting riparian habitat and water quality would help to protect areas where these species, particularly the two-striped garter snake, may be found. General practices that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include GP-3, GP-5, GP-11, GP-12, GP-17, GP-19, GP-24, GP-34, GP-35, GP-38, GP-41, GP-42, GP-43, GP-45, GP-46, GP-47, GP-48, GP-49, GP-53, and GP-54. Mitigation measures that would reduce short- or long-term effects to San Bernardino ringneck snake, coastal rosy boa, and two-striped garter snake include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), HYD-2 (New Road Construction Over Waterways), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-3 (Incorporate riparian area avoidance and permit measures), BIO-4 (Provide restoration/compensation for affected jurisdictional areas), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

Coast (San Diego) Horned Lizard – The Forest Service Sensitive and CDFG Species of Special Concern coast (San Diego) horned lizard is known to be present within Alternatives 1, 2, 2a, the reconductoring component, and Segment J. It is likely to occur on Alternative 3. LADWP's PP2 Tailings Removal Project removed small amounts of habitat for this species in the project's fill sites, although no individuals were observed during project construction. This species is known to be present or likely within multiple segments of SCE's TRTP. TRTP has identified many of the same threats to this species as BRRTP, citing the possibility of crushing during construction, disturbance from human activity, and habitat loss or degradation. The Antelope-Pardee 500 kV Transmission Line Project and TRTP run close to BRRTP and will exert cumulative effects on many species due to proximity, resulting in habitat loss in ANF. Individual animals may be injured or killed as a result of these projects, resulting in a cumulative reduction in local or regional populations. The effects from these projects will be long-term when considered cumulatively, as they will be constructed over several years. ANF management projects may improve or degrade suitable habitat for this species depending on the nature of the project. For example, fuelbreak projects will remove suitable habitat as they remove shrubs and chaparral that this species hides and forages under. However, OHV restoration projects will likely improve habitat by reestablishing natural vegetation and restricting human access into these areas. General practices and mitigation measures to protect the coast horned lizard would be implemented during construction of the BRRTP. General practices that would reduce short- or long-term effects to coast horned lizard include GP-24,,GP-34, GP-41, GP-42, GP-43, GP-48, and GP-49. Mitigation measures that would reduce short- or long-term effects to coast horned lizard include AIR-2a (Implement construction fugitive dust control plan), HYD-1 (Use of Existing Water Crossings), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way), BIO-5 (Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife), BIO-6 (Implement a Worker Environmental Awareness Program), and BIO-22 (Protect special-status reptile species).

6.0 SUMMARY OF DETERMINATION EFFECTS

The following determination of effects to Forest Service sensitive species have been made as a result of the BRRTP:

SPECIES	DETERMINATION
Botanical Species	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, special-status botanical species.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, special-status botanical species.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, special-status botanical species.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, special-status botanical species.
Swainson's Hawk, Peregrine Falcon, and Bald Eagle	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the Swainson's hawk, peregrine falcon, and bald eagle.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the Swainson's hawk, peregrine falcon, and bald eagle.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the Swainson's hawk, peregrine falcon, and bald eagle.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the Swainson's hawk, peregrine falcon, and bald eagle.
California Spotted Owl	Alternative 1 would have no effect on the California spotted owl.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the California spotted owl.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the California spotted owl.
	Alternative 3 would have no effect on the California spotted owl.
Pallid Bat, Townsend's Big-Eared Bat, and Western Red Bat	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for pallid bat, Townsend's big-eared bat, and western red bat.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for pallid bat, Townsend's big-eared bat, and western red bat.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for pallid bat, Townsend's big-eared bat, and western red bat.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for pallid bat, Townsend's big-eared bat, and western red bat.
White-eared Pocket Mouse and Tehachapi Pocket Mouse	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the white-eared pocket mouse and Tehachapi pocket mouse.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the white-eared pocket mouse and Tehachapi pocket mouse.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the white-eared pocket mouse and Tehachapi pocket mouse.
	Alternative 3 would have no effect on the white-eared pocket mouse and Tehachapi pocket mouse.
Arroyo Chub	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the arroyo chub.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the arroyo chub.

SPECIES	DETERMINATION
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the arroyo chub.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the arroyo chub.
California Legless Lizard	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for the California legless lizard.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for the California legless lizard.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for the California legless lizard.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for the California legless lizard.
Southwestern Pond Turtle	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing for, southwestern pond turtle.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing for, southwestern pond turtle.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing for, southwestern pond turtle.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing for, southwestern pond turtle.
San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-Striped Garter Snake	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing for, the San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-striped Garter Snake.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing for, the San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-striped Garter Snake.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing for, the San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-striped Garter Snake.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing for, the San Bernardino Ringneck Snake, Coastal Rosy Boa, and Two-striped Garter Snake.
Coast Horned Lizard	Alternative 1 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the coast horned lizard.
	Alternative 2 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the coast horned lizard.
	Alternative 2a may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the coast horned lizard.
	Alternative 3 may affect individuals of, but is not likely to result in a trend toward federal listing or loss of viability for, the coast horned lizard.

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8.0 LIST OF ACRONYMS

AC	Alternating Current
ACSS/AW	Aluminum Conductor Steel Supported/Aluminum-clad Steel Wire
ACSS/TW/HS	Aluminum Conductor Steel Supported/Trapezoidal Wires/High Strength
ANF	Angeles National Forest
APLIC	Avian Power Line Interaction Committee
APM	Applicant Proposed Measure
BA	Biological Assessment
BCC	Bird of Conservation Concern
BE	Biological Evaluation
BLM	Bureau of Land Management
BLM S	Bureau of Land Management Sensitive
BMP	Best Management Practice
BR-RIN	Barren Ridge – Rinaldi
BRRTP	Barren Ridge Renewable Transmission Project
CDFG	California Department of Fish and Game
CDFG SSC	California Department of Fish and Game Species of Special Concern
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPM	Environmental Protection Measure
FC	Federal Candidate
FE	Federal Endangered
FP	Fully Protected
FR	Federal Registry
FS	Forest Service
FS MIS	Forest Service Management Indicator Species
FS S	Forest Service Sensitive
FT	Federal Threatened
FWS	Fish and Wildlife Service
GAP	Gap Analysis Program
GIS	Geographic Information System
GP	General Practice
kcmil	1,000 circular mills (unit of area)
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
LMP	Land Management Plan
NDDB	Natural Diversity Database
NFS	National Forest Service
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
OHV	Off Highway Vehicle
PDCI	Pacific Direct Current Intertie
PP2	Power Plant #2
RCA	Riparian Conservation Area
ROW	Right of Way

RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
SE	State Endangered
SEA	Significant Ecological Area
SR	State Rare
ST	State Threatened
T&E	Threatened & Endangered
TEPS	Threatened, Endangered, Proposed, or Sensitive
TRTP	Tehachapi Renewable Transmission Project
TSP	Tubular Steel Pole
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WBWG	Western Bat Working Group
WBWG H	Western Bat Working Group High Priority
WEAP	Worker Environmental Awareness Program

9.0 LIST OF PREPARERS

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APPENDIX A: WILDLIFE SPECIES OBSERVED IN PROJECT AREA (FIELD SEASON: 2008-2010)

Common Name	Scientific Name
AMPHIBIANS	
Family Bufonidae – True Toads	
Western toad	*Anaxyrus boreas*
Family Hylidae – Treefrogs and their Allies	
California treefrog	*Pseudacris cadaverina*
Pacific treefrog	*Pseudacris regilla*
BIRDS	
Family Anatidae – Ducks, Geese, Swans	
Northern shoveler	*Anas clypeata*
Mallard	*Anas platyrhynchos*
Family Odontophoridae – New World Quail	
California quail	*Callipepla californica*
Family Cathartidae – New World Vultures	
Turkey vulture	*Cathartes aura*
Family Accipitridae – Hawks, Kites, Eagles, Allies	
Cooper's hawk	*Accipiter cooperii*
Sharp-shinned hawk	*Accipiter striatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-shouldered hawk	*Buteo lineatus*
Swainson's hawk	*Buteo swainsonii*
Northern harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Family Falconidae – Caracaras, Falcons	
Merlin	*Falco columbarius*
Peregrine falcon	*Falco peregrinus*
American kestrel	*Falco sparverius*
Family Columbidae – Pigeons, Doves	
Rock pigeon	*Columbia livia*
Mourning dove	*Zenaida macroura*
Families Tytonidae and Strigidae – Owls	
Long-eared owl	*Asio otus*
Great horned owl	*Bubo virginianus*
Northern pygmy-owl	*Glaucidium gnoma*
Western screech-owl	*Megascops kennicottii*
Family Trochilidae – Hummingbirds	
Black-chinned hummingbird	*Archilochus alexandri*
Anna's hummingbird	*Calypte anna*
Allen's hummingbird	*Selasphorus sasin*
Family Picidae – Woodpeckers, Allies	
Northern flicker	*Colaptes auratus*
Acorn woodpecker	*Melanerpes formicivorus*
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Family Tyrannidae – Tyrant Flycatchers	
Pacific-slope flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
Western kingbird	*Tyrannus verticalis*
Family Laniidae – Shrikes	
Loggerhead shrike	*Lanius ludovicianus*

Common Name	Scientific Name
Family Corvidae – Crows, Jays	
Western scrub-jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Family Alaudidae – Larks	
Horned lark	*Eremophila alpestris*
Family Hirundinidae – Swallows	
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Family Timaliidae – Babblers	
Wrentit	*Chamaea fasciata*
Family Paridae – Chickadees, Titmice	
Oak titmouse	*Baeolophus inornatus*
Family Aegithalidae – Long-tailed Tits, Bushtits	
Bushtit	*Psaltriparus minimus*
Family Sittidae – Nuthatches	
Red-breasted nuthatch	*Sitta canadensis*
Family Troglodytidae – Wrens	
Canyon wren	*Catherpes mexicanus*
Bewick's wren	*Thryomanes bewickii*
House wren	*Troglodytes aedon*
Family Regulidae – Kinglets	
Ruby-crowned kinglet	*Regulus calendula*
Family Sylviidae – Old World Warblers, Gnatcatchers	
Blue-gray gnatcatcher	*Polioptila caerulea*
California gnatcatcher	*Polioptila californica*
Family Turdidae – Thrushes	
American robin	*Turdus migratorius*
Family Mimidae – Mockingbirds, Thrashers	
Northern mockingbird	*Mimus polyglottos*
Le Conte's thrasher	*Toxostoma crissale*
California thrasher	*Toxostoma redivivum*
Family Sturnidae – Starlings	
European starling	*Sturnus vulgaris*
Family Motacillidae – Wagtails, Pipits	
American pipit	*Anthus rubescens*
Family Bombycillidae – Waxwings	
Cedar waxwing	*Bombycilla cedrorum*
Family Ptilogonatidae – Silky-flycatchers	
Phainopepla	*Phainopepla nitens*
Family Parulidae – Wood-warblers	
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Yellow-breasted chat	*Icteria virens*
Orange-crowned warbler	*Vermivora celata*
Family Emberizidae – Emberizids	
Sage sparrow	*Amphispiza belli*
Dark-eyed junco	*Junco hyemalis*
Song sparrow	*Melospiza melodia*
California towhee	*Pipilo crissalis*
Spotted towhee	*Pipilo maculatus*
White-crowned sparrow	*Zonotrichia leucophrys*
Family Cardinalidae – Cardinals, Saltators, Allies	
Black-headed grosbeak	*Pheucticus melanocephalus*

Common Name	Scientific Name
Family Icteridae – Blackbirds	
Brewer's blackbird	*Euphagus cyanocephalus*
Brown-headed cowbird	*Molothrus ater*
Western meadowlark	*Sturnella neglecta*
Family Fringillidae – Fringilline and Cardueline Finches, Allies	
Lesser goldfinch	*Carduelis psaltria*
House finch	*Carpodacus mexicanus*
Family Passeridae – Old World Sparrows	
House sparrow	*Passer domesticus*
FISH	
Family Cyprinidae – Carps and Minnows	
Arroyo chub	*Gila orcuttii*
Family Ictaluridae – North American Freshwater Catfishes	
Black bullhead	*Ameiurus melas*
Family Poeciliidae – Livebearers	
Mosquitofish	*Gambusia affinis*
MAMMALS	
Family Canidae – Wolves and Foxes	
Coyote	*Canis latrans*
Common gray fox	*Urocyon cinereoargenteus*
Family Cervidae – Deer	
Mule deer	*Odocoileus hemionus*
Family Felidae – Cats	
Bobcat	*Lynx rufus*
Family Heteromyidae – Pocket Mice and Kangaroo Rats	
Kangaroo rat	*Dipodomys sp.*
Family Leporidae – Rabbits and Hares	
Black-tailed jackrabbit	*Lepus californicus*
Family Vespertilionidae – Vesper Bats	
Big brown bat	*Eptesicus fuscus*
California myotis	*Myotis californicus*
REPTILES	
Family Boidae – Boas	
Coastal rosy boa	*Lichanura trivirgata roseofusca*
Family Colubridae – Colubrids	
California striped racer	*Masticophis lateralis lateralis*
Two-striped garter snake	*Thamnophis hammondii*
Family Phrynosomatidae – North American Spiny Lizards and Their Allies	
Coast horned lizard	*Phrynosoma coronatum*
Western fence lizard	*Sceloporus occidentalis*
Common side-blotched lizard	*Uta stansburiana*
Family Teiidae – Whiptails and Their Allies	
Tiger Whiptail	*Aspidoscelis tigris*
Family Viperidae – Vipers	
Southern Pacific rattlesnake	*Crotalus oreganus helleri*

Plant Species Observed in Project Area (Field Season: 2008-2010)

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
FERNS AND FERN ALLIES							
PTERIDACEAE	**MAIDENHAIR FERN FAMILY**						
Pellaea andromedifolia	coffee cliffbrake		X	X		X	
Pellaea mucronata	birdfoot cliffbrake		X	X	X	X	
Pentagramma triangularis	goldback fern		X			X	
SELAGINELLACEAE	**SPIKE-MOSS FAMILY**						
Selaginella bigelovii	bushy spikemoss	X	X	X		X	
GYMNOSPERMS							
CUPRESSACEAE	**CYPRESS FAMILY**						
Juniperus californica	California juniper	X					
EPHEDRACEAE	**MORMON-TEA FAMILY**						
Ephedra sp.	jointfir				X		
PINACEAE	**PINE FAMILY**						
Pinus monophylla	singleleaf pinyon	X					
Pinus sabiniana	California foothill pine	X					
Pseudotsuga macrocarpa	bigcone Douglas-fir			X			
FLOWERING PLANTS – DICOTS							
ACERACEAE	**MAPLE FAMILY**						
Acer macrophyllum	bigleaf maple			X			
ANACARDIACEAE	**SUMAC FAMILY**						
Malosma laurina	laurel sumac	X					
Rhus ovata	sugar sumac	X	X		X	X	X
Rhus trilobata	skunkbush sumac	X	X	X	X	X	X
Toxicodendron diversilobum	poison oak	X	X	X	X	X	X
APIACEAE	**CARROT FAMILY**						
*Anthriscus caucalis**	bur chervil		X			X	
Apiastrum angustifolium	mock parsley		X	X		X	
Bowlesia incana	hoary bowlesia		X			X	
Daucus pusillus	American wild carrot		X			X	
Lomatium dasycarpum	woollyfruit desertparsley		X			X	
Lomatium mohavense ssp. *mohavense*	Mojave desertparsley		X			X	
Sanicula arguta	sharptooth blacksnakeroot		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
Sanicula crassicaulis	Pacific blacksnakeroot		X	X		X	
Sanicula tuberosa	turkey pea		X			X	
Tauschia arguta	southern umbrellawort			X			
Tauschia sp.	umbrellawort	X					
ASCLEPIADACEAE	**MILKWEED FAMILY**						
Asclepias eriocarpa	woollypod milkweed	X					
Asclepias fascicularis	narrow-leaved milkweed		X			X	
ASTERACEAE	**ASTER FAMILY**						
Achyrachaena mollis	blow-wives		X			X	
Acourtia microcephala	sacapellote		X	X		X	
Agoseris grandiflora	large-flowered agoseris		X			X	
Agoseris retrorsa	spear-leaved agoseris		X	X	X	X	X
Agoseris sp.	agoseris			X			
Ambrosia acanthicarpa	flatspine bur ragweed		X			X	
Ambrosia dumosa	burrobush			X			
Ambrosia psilostachya	western ragweed		X			X	
Ambrosia sp.	ragweed	X					
Artemisia californica	coastal sagebrush	X	X	X	X	X	X
Artemisia douglasiana	mugwort		X	X		X	
Artemisia dranunculus	tarragon	X		X			
Artemisia tridentata	big sagebrush	X		X			
Baccharis douglasii	Douglas' baccharis		X	X		X	
Baccharis pilularis	coyotebrush		X			X	
Baccharis salicifolia	mulefat	X	X	X		X	X
Brickellia californica	California brickellbush		X	X		X	
Brickellia nevinii	Nevin's brickellbush	X					
*Carduus pycnocephalus**	Italian plumeless thistle		X			X	X
*Centaurea melitensis**	Maltese star-thistle	X	X	X		X	X
*Centaurea solstitialis**	yellow star-thistle	X					
Chaenactis fremontii	Fremont pincushion	X	X			X	X
Chaenactis glabriuscula	yellow pincushion	X	X		X	X	X
*Chamomilla suaveolens**	pineapple weed		X	X		X	
Chrysothamnus nauseosus	rubber rabbitbrush	X		X			
Cirsium occidentale	cobwebby thistle	X	X	X	X	X	X
*Cnicus benedictus**	blessed thistle	X					X
Coreopsis bigelovii	Bigelow's tickseed		X			X	

Scientific Name[1]	**Common Name**[2]	**Project Component**					
		Alternative 1	**Alternative 2**	**Alternative 2a**	**Alternative 3**	**Reconductoring**	**New 230 kV Circuit**
Coreopsis sp.	tickseed	X					X
Corethrogyne filaginifolia	California aster	X	X	X		X	X
Deinandra (=Hemizonia) fasciculata	fascicled tarweed		X	X		X	
Encelia actonii	sunflower			X			X
Encelia californica	California brittlebush	X				X	X
Ericameria linearifolia	narrowleaf goldenbush	X	X	X		X	
Ericameria pinifolia	pinebush	X	X			X	
Erigeron foliosus	leafy fleabane	X	X			X	
Eriophyllum confertiflorum	golden yarrow	X	X	X	X	X	X
Filago californica	California cottonrose	X	X	X		X	X
*Filago gallica**	narrowleaf cottonrose	X	X			X	X
*Gazania linearis**	treasureflower		X			X	
Gnaphalium californicum	California cudweed		X	X		X	X
Gnaphalium canescens	Wright's cudweed			X			
Gnaphalium stramineum	cotton-batting plant		X	X		X	
Gnaphalium sp.	cudweed	X	X			X	X
Gutierrezia californica	San Joaquin snakeweed	X	X	X		X	X
Gutierrezia sarothrae	broom snakeweed						X
Hazardia squarrosa	Sawtooth goldenbush		X	X	X	X	
Helianthus annuus	common sunflower	X					
Helianthus gracilentus	slender sunflower	X	X	X	X	X	X
Hemizonia fasciculata	clustered tarweed		X			X	
Hemizonia sp.	Tarweed		X			X	
Heterotheca grandiflora	telegraph weed		X			X	X
Heterotheca sessiliflora	silver telegraph weed		X			X	
Isocoma menziesii	Menzies' goldenbush		X	X		X	X
*Lactuca serriola**	prickly lettuce		X			X	
Lagophylla ramosissima	common hareleaf		X	X		X	X
Lasthenia californica	California goldfields		X	X		X	X
Layia glandulosa	whitedaisy tidytips	X		X			
Lepidospartum squamatum	California broomsage	X	X	X		X	X
Lessingia glandulifera	valley lessingia		X			X	
Lessingia filaginifolia var. *filaginifolia*	common sandaster	X	X			X	
Lessingia sp.	lessingia	X					
Madia exigua	threadsteam madia		X			X	
Malacothrix clevelandii	Cleveland's desertdandelion		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
CHENOPODIACEAE	**GOOSEFOOT FAMILY**						
Atriplex canescens	fourwing saltbush	X	X			X	
Atriplex confertifolia	shadscale saltbush						X
Chenopodium californicum	California goosefoot		X	X		X	
*Salsola tragus**	prickly Russian thistle	X	X			X	
*Salsola sp.**	Russian thistle		X			X	
CISTACEAE	**ROCK-ROSE FAMILY**						
*Cistus sp.**	rockrose		X			X	
Helianthemum scoparium	Bisbee Peak rushrose		X	X		X	X
CONVOLVULACEAE	**MORNING GLORY FAMILY**						
Calystegia macrostegia	morning glory	X	X			X	X
Calystegia peirsonii+	Peirson's morning glory		X		X	X	X
CRASSULACEAE	**STONECROP FAMILY**						
Crassula connata	sand pygmy		X			X	
Dudleya lanceolata	Lanceleaf liveforever	X	X	X	X	X	X
Dudleya pulverulenta	chalk dudleya		X			X	
CUCURBITACEAE	**GOURD FAMILY**						
Marah macrocarpus	Cucamonga manroot	X	X	X	X	X	X
CUSCUTACEAE	**DODDER FAMILY**						
Cuscuta californica	chaparral dodder	X	X	X	X	X	X
Cuscuta sp.	dodder		X			X	
DATISCACEAE	**DATISCA FAMILY**						
Datisca glomerata	durango root		X	X		X	
ERICACEAE	**HEATH FAMILY**						
Arctostaphylos glandulosa	Eastwood's manzanita		X	X		X	
Arctostaphylos glauca	bigberry manzanita	X	X	X		X	X
EUPHORBIACEAE	**SPURGE FAMILY**						
Chamaesyce sp.	sandmat		X			X	X
Croton californicus	California croton		X			X	
Eremocarpus setigerus	turkey mullein	X	X			X	X
FABACEAE	**PEA FAMILY**						
Astragalus didymocarpus	dwarf white milkvetch		X			X	
Astragalus sp.	milkvetch		X			X	X
Lathyrus vestitus ssp. vestitus	Pacific pea		X	X		X	
Lotus oblongifolius	wet foot trefoil			X			
Lotus purshianus	lotus		X	X		X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
Lotus scoparius	common deerweed	X	X	X		X	X
Lotus strigosus	strigose bird's-foot trefoil		X	X	X	X	X
Lupinus benthamii	Bentham lupine		X	X		X	X
Lupinus bicolor	miniature lupine		X			X	
Lupinus concinnus	bajada lupine	X	X	X	X	X	X
Lupinus excubitus	grape soda lupine		X	X		X	
Lupinus hirsutissimus	stinging lupine	X	X	X		X	X
Lupinus microcarpus var. *microcarpus*	valley lupine		X			X	
Lupinus nanus	sky lupine		X		X	X	X
Lupinus sparsiflorus	sparse-flowered lupine		X	X		X	
Lupinus succulentus	arroyo lupine		X			X	
Lupinus truncatus	collared annual lupine		X			X	
Lupinus sp.	lupine	X					
*Medicago polymorpha**	burclover		X			X	
Melilotus albus	white sweetclover		X			X	
*Melilotus indicus**	yellow sweetclover	X	X			X	X
*Melilotus officinalis**	yellow sweet-clover		X	X		X	
*Spartium junceum**	Spanish broom		X			X	
Trifolium albopurpureum	rancheria clover		X			X	
*Trifolium hirtum**	rose clover		X	X	X	X	
Trifolium willdenovii	tomcat clover		X	X		X	
FAGACEAE	**OAK FAMILY**						
Quercus agrifolia	California live oak		X	X		X	
Quercus berberidifolia	scrub oak	X	X	X		X	
Quercus chrysolepis	canyon live oak	X	X	X		X	X
Quercus dumosa	California scrub oak				X		
Quercus garryana	Oregon white oak			X			
Quercus john-tuckeri	Tucker oak	X	X	X		X	X
Quercus wislizenii var. *frutescens*	interior live oak			X			
GARRYACEAE	**SILK TASSEL FAMILY**						
Garrya flavescens	ashy silk tassel	X		X			
GERANIACEAE	**GERANIUM FAMILY**						
*Erodium cicutarium**	redstem stork's bill	X	X	X	X	X	X
Erodium cicutarium ssp. *cicutarium*	redstem stork's bill		X			X	X
GROSSULARIACEAE	**GOOSEBERRY FAMILY**						
Ribes aureum	golden currant		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
Ribes malvaceum	chaparral currant			X			
Ribes menziesii	canyon gooseberry			X			
HYDROPHYLLACEAE	**WATERLEAF FAMILY**						
Emmenanthe penduliflora	whispering bells	X	X	X	X	X	X
Eriodictyon crassifolium	thickleaf yerba santa	X	X	X	X	X	X
Eucrypta chrysanthemifolia	spotted hideseed		X	X		X	X
Nemophila parviflora var. *parviflora*	small flower nemophila			X			
Nemophila sp.	nemophila		X	X		X	
Phacelia brachyloba	short-lobed phacelia		X	X		X	
Phacelia campanularia	desert bluebells				X		
Phacelia cicutaria	caterpillar phacelia	X	X	X	X	X	X
Phacelia distans	common phacelia		X	X		X	
Phacelia imbricata	imbricate phacelia		X			X	
Phacelia minor	wild canterbury bluebells		X		X	X	X
Phacelia parryi	Parry's phacelia		X			X	
Phacelia ramosissima	branching phacelia		X	X		X	
Phacelia sp.	phacelia	X	X			X	X
Pholistoma auritum var. *auritum*	blue fiesta flower		X			X	
LAMIACEAE	**MINT FAMILY**						
*Marrubium vulgare**	common horehound	X	X			X	X
Salvia apiana	white sage	X	X	X	X	X	X
Salvia columbariae	chia	X	X	X	X	X	X
Salvia leucophylla	purple sage		X	X		X	X
Salvia mellifera	black sage	X	X	X	X	X	X
Salvia pachyphylla	blue sage		X			X	
Scutellaria tuberosa	Danny's skullcap		X	X		X	
Stachys albens	white hedge-nettle		X	X		X	
Stachys sp.	hedge nettle			X			
Trichostema lanatum	woolly bluecurls		X	X	X	X	X
Trichostema lanceolatum	vinegar weed		X			X	
Trichostema parishii	Parish's bluecurls		X	X		X	
LOASACEAE	**LOASA FAMILY**						
Mentzelia albicaulis	blazing star	X	X	X	X	X	X
Mentzelia micrantha	San Luis blazing star	X	X			X	X
Mentzelia sp.	blazing star	X					

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
MALVACEAE	**MALLOW FAMILY**						
Malacothamnus fasciculatus	bushmallow		X	X		X	
NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**						
Mirabilis californica	California four o'clock		X	X	X	X	X
OLEACEAE	**OLIVE FAMILY**						
Fraxinus dipetala	California ash		X	X		X	
Fraxinus velutina	velvet ash	X	X			X	
ONAGRACEAE	**EVENING PRIMROSE FAMILY**						
Camissonia bistorta	southern sun cup		X			X	
Camissonia californica	California sun cup	X	X	X		X	X
Camissonia hirtella	hairy sun cup		X				
Camissonia ignota	suncup			X			
Camissonia palmeri	Palmer evening primrose			X			
Camissonia strigulosa	strigulose sun cup		X			X	
Camissonia sp.	suncup	X	X	X		X	X
Clarkia epilobioides	canyon clarkia		X			X	
Clarkia purpurea ssp. *quadrivulnera*	winecup clarkia		X	X		X	
Clarkia speciosa ssp. *speciosa*	redspot clarkia		X			X	
Clarkia unguiculata	elegant clarkia		X			X	
Epilobium brachycarpum	panicled willow-herb		X			X	
Epilobium canum	hummingbird trumpet	X	X	X		X	
Epilobium sp.	willow-herb	X		X			X
Oenothera elata ssp. *hookeri*	Hooker's evening primrose			X			
Oenothera sp.	evening primrose	X					
OROBANCHACEAE	**BROOMRAPE FAMILY**						
Orobanche bulbosa	chaparral broomrape	X		X			X
Orobanche fasciculata	clustered broomrape	X		X			X
PAPAVERACEAE	**POPPY FAMILY**						
Argemone munita	prickly poppy		X	X		X	
Dendromecon rigida	tree poppy		X	X		X	
Dicentra chrysantha	golden ear-drops		X	X		X	
Eschscholzia californica	California poppy	X	X	X	X	X	X
Papaver californicum	fire poppy		X			X	
PLANTAGINACEAE	**PLANTAIN FAMILY**						
Plantago erecta	California plantain		X			X	X

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
PLATANACEAE	**PLANE TREE FAMILY**						
Platanus racemosa	California sycamore		X	X		X	
POLEMONIACEAE	**PHLOX FAMILY**						
Allophyllum divaricatum	purple false gilyflower		X	X		X	
Allphyllum gilioides	dense false gilyflower		X			X	
Eriastrum densifolium	giant woollystar	X	X	X		X	X
Eriastrum sapphirinum	sapphire woollystar	X	X			X	
Gilia brecciarum	Nevada gilia		X				
Gilia capitata	bluehead gilia	X	X	X	X	X	X
Gilia clivorum	many-stemmed gilia		X			X	
Gilia sp.	gilia	X	X	X	X	X	
Leptodactylon californicum	prickly phlox			X			
Leptodactylon pungens	granite gilia		X			X	
Linanthus dichotomus	evening snow		X		X	X	
Linanthus dianthiflorus	fringed linanthus		X	X		X	
Linanthus parviflorus	false baby stars		X			X	
Linanthus sp.	linanthus	X	X	X		X	X
Navarretia hamata	southern hooked navarretia		X			X	
POLYGONACEAE	**BUCKWHEAT FAMILY**						
Chorizanthe staticoides	Turkish rugging	X	X	X	X	X	X
Chorizanthe xanti	Riverside spineflower	X					
Chorizanthe sp.	spineflower			X			
Eriogonum deflexum	flat crown buckwheat	X					
Eriogonum elongatum	long stem buckwheat	X	X	X		X	
Eriogonum fasciculatum	California buckwheat	X	X	X		X	X
Eriogonum fasciculatum var. *foliolosum*	California buckwheat		X			X	
Eriogonum fasciculatum ssp. *polifolium*	California buckwheat	X	X	X	X	X	X
Eriogonum sp.	annual buckwheat	X		X			X
Pterostegia drymarioides	woodland pterostegia		X	X		X	
PORTULACACEAE	**PURSLANE FAMILY**						
Calandrinia ciliata	red maids		X			X	
Calyptridium monandrum	pussy paws		X	X		X	
Calyptridium sp.	pussy paws	X	X			X	X
Claytonia perfoliata	miner's lettuce	X	X	X		X	X
Dodecatheon clevelandii	padre's shooting star		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
RANUNCULACEAE	**BUTTERCUP FAMILY**						
Clematis sp.	virgin's bower		X	X	X	X	
Delphinium parryi	San Bernardino larkspur	X	X	X		X	X
Delphinium sp.	larkspur	X	X	X		X	
Ranunculus californicus	California buttercup			X			
Ranunculus hebecarpus	delicate buttercup		X			X	
Thalictrum fendleri var. polycarpum	common meadow-rue		X			X	
RHAMNACEAE	**BUCKTHORN FAMILY**						
Ceanothus crassifolius	hoaryleaf ceanothus		X			X	
Ceanothus cuneatus	buckbrush	X	X	X		X	X
Ceanothus greggii	desert ceanothus	X			X		X
Ceanothus leucodermis	chaparral white thorn		X	X		X	
Rhamnus californica	coffee berry			X			
Rhamnus ilicifolia	redberry	X	X		X	X	X
Rhamnus tomentella	hoary coffeeberry			X	X		
ROSACEAE	**ROSE FAMILY**						
Adenostoma fasciculatum	chamise	X	X	X	X	X	X
Cercocarpus betuloides	mountain mahogany	X	X	X		X	
Heteromeles arbutifolia	toyon	X	X	X	X	X	
Potentilla glandulosa	Cinquefoil		X			X	
Prunus ilicifolia	hollyleaf cherry	X	X	X	X	X	
Rosa californica	California wild rose		X	X		X	
Rosa sp.	rose			X			
Rubus ursinus	California blackberry		X			X	
RUBIACEAE	**MADDER FAMILY**						
Galium andrewsii	Andrews' bedstraw	X	X	X		X	
Galium angustifolium	narrow-leaf bedstraw	X	X	X		X	X
Galium aparine	sticky willy		X	X		X	
Galium hallii	nodding bedstraw			X			
SALICACEAE	**WILLOW FAMILY**						
Populus fremontii	Fremont cottonwood	X	X	X		X	
Salix exigua	narrow leaf willow		X	X		X	
Salix laevigata	red willow	X	X	X		X	
Salix lasiolepis	arroyo willow	X	X	X		X	
Salix sp.	Willow		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
SIMAROUBACEAE	**QUASSIA FAMILY**						
Ailanthus altissima	tree of heaven		X			X	
SCROPHULARIACEAE	**FIGWORT FAMILY**						
Antirrhinum coulterianum	white snapdragon		X			X	
Antirrhinum kelloggii	Kellogg's snapdragon		X			X	
Antirrhinum multiflorum	chaparral snapdragon		X			X	
Castilleja applegatei	Indian paintbrush			X			
Castilleja exserta	Exserted Indian paintbrush	X	X			X	X
Castilleja foliolosa	Texas Indian paintbrush	X	X	X		X	X
Castilleja minor ssp. *spiralis*	annual Indian paintbrush	X		X	X		X
Collinsia heterophylla	purple Chinese houses		X	X		X	
Cordylanthus rigidus	bird's beak	X	X	X		X	X
Keckiella breviflora	bush beardtongue	X					
Keckiella cordifolia	heart-leaved penstemon		X	X		X	
Keckiella ternata	scarlet keckiella	X	X	X		X	X
Mimulus aurantiacus	sticky monkeyflower		X	X		X	
Mimulus brevipes	wide-throated yellow monkeyflower		X			X	
Mimulus cardinalis	scarlet monkeyflower		X	X		X	
Mimulus guttatus	seep monkeyflower	X	X	X		X	X
Mimulus pilosus	downy monkeyflower	X	X			X	X
Penstemon centranthifolius	scarlet bugler	X	X	X		X	X
Penstemon grinnellii	Grinnell's beardtongue	X		X			X
Penstemon heterophyllus	chaparral penstemon			X			
Penstemon spectabilis	showy penstemon	X	X	X	X	X	X
Veronica americana	American brooklime		X			X	
*Veronica anagallis-aquatica**	water speedwell		X			X	
SOLANACEAE	**NIGHTSHADE FAMILY**						
Datura wrightii	sacred thorn-apple	X	X			X	
*Nicotiana glauca**	tree tobacco		X		X	X	X
Solanum xanti	chaparral nightshade		X	X		X	X
TAMARICACEAE	**TAMARISK FAMILY**						
*Tamarix ramosissima**	tamarisk		X			X	
Tamarix sp.	tamarisk	X					
URTICACEAE	**NETTLE FAMILY**						
Urtica dioica ssp. *holosericea*	hoary nettle		X			X	

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
*Urtica urens**	dwarf nettle		X			X	
VERBENACEAE	**VERVAIN FAMILY**						
Verbena lasiostachys	verbena			X			
VIOLACEAE	**VIOLET FAMILY**						
Viola purpurea	violet			X			
VISCACEAE	**MISTLETOE FAMILY**						
Phoradendron sp.	mistletoe	X					
FLOWERING PLANTS – MONOCOTS							
CYPERACEAE	**SEDGE FAMILY**						
Carex dudleyi	Dudley's sedge		X			X	
Carex sp.	sedge			X			
Eleocharis parishii	Parish's spike-rush		X			X	
JUNCACEAE	**RUSH FAMILY**						
Juncus bufonius	toad-rush		X			X	
Juncus dubius	questionable rush			X			
Juncus occidentalis	western rush		X			X	
Juncus sp.	rush			X			
LILIACEAE	**LILY FAMILY**						
Allium sp.	wild onion						
Bloomeria crocea	common goldenstar		X		X	X	X
Calochortus clavatus var. *clavatus*+	club-haired mariposa lily		X		X	X	
Calochortus clavatus var. *gracilis*+	slender mariposa lily	X	X		X	X	
Calochortus venustus	butterfly mariposa lily		X		X	X	
Chlorogalum pomeridianum	wavyleaf soap plant		X	X		X	
Dichelostemma capitatum	bluedicks	X	X	X	X	X	X
Muilla maritima	common muilla	X	X			X	X
Yucca whipplei	chaparral yucca	X	X	X	X	X	X
POACEAE	**GRASS FAMILY**						
Achnatherum coronatum	giant needlegrass	X	X	X		X	X
Achnatherum speciosum	desert needlegrass	X	X	X		X	
*Avena barbata**	slender oat	X	X	X		X	X
*Avena fatua**	wild oat	X	X	X		X	X
Bromus carinatus var. *carinatus*	smooth brome		X			X	
*Bromus diandrus**	ripgut brome	X	X	X		X	X
*Bromus hordeaceus**	soft brome	X	X	X		X	X
*Bromus madritensis **	compact brome	X	X	X		X	X

Scientific Name[1]	Common Name[2]	Project Component					
		Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Reconductoring	New 230 kV Circuit
*Bromus tectorum**	cheatgrass	X	X	X		X	X
Cynodon dactylon	Bermudagrass	X					
Distichlis spicata	salt grass	X	X			X	
Elymus elymoides	Squirreltail	X					
Elymus glaucus	blue wildrye	X		X			X
Elymus triticoides	beardless wild-rye	X	X			X	X
Elymus sp.	wild rye			X			
Hordeum murinum	barley		X			X	
*Lamarckia aurea**	goldentop grass		X	X		X	X
Leymus condensatus	giant wildrye	X	X	X	X	X	X
Melica californica	California melicgrass		X			X	
Melica imperfecta	California melicgrass		X	X		X	X
Nassella cernua	nodding needlegrass		X			X	X
Nassella lepida	foothill needlegrass	X	X			X	X
Nassella pulchra	purple needlegrass	X	X			X	
*Piptatherum miliaceum**	Smilograss	X	X	X		X	
Poa secunda	Sandberg bluegrass	X	X	X		X	X
*Polypogon monspeliensis**	annual rabbitsfoot grass		X			X	
*Schismus arabicus**	Arabian schismus		X			X	
*Schismus barbatus**	common Mediterranean grass	X	X	X		X	X
*Schismus sp.**	Mediterranean grass		X		X	X	
Vulpia microstachys	small fescue	X	X	X		X	X
*Vulpia myuros**	rat-tail fescue	X	X	X		X	X
Vulpia octoflora var. octoflora	six-weeks fescue	X					
TYPHACEAE	**CAT-TAIL FAMILY**						
Typha latifolia	broadleaf cattail		X			X	

APPENDIX B: DETAILED CONSTRUCTION, OPERATION, AND MAINTENANCE PROCESS

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BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Detailed Construction, Operations and Maintenance Process

POWER
ENGINEERS

BRRTP CONSTRUCTION, OPERATION AND MAINTENANCE

1.0 230 KV DOUBLE-CIRCUIT TRANSMISSION LINE

1.1 CONSTRUCTION SEQUENCE

Construction of a transmission line involves the following general sequence of events: surveying the centerline; identifying and constructing access roads; clearing right-of-way and tower sites (including construction yards and batch plants); installing foundations; assembling and erecting the towers; clearing, pulling, tensioning, and splicing sites; installing ground wires and conductors; installing counterpoise; switching station tie in; and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process for the Barren Ridge Renewable Transmission Project (BRRTP). This would require several contractors operating at the same time and in different locations.

The following section describes the construction components necessary for the assembly and installation of the proposed double-circuit transmission line. The description of transmission line construction sequencing and estimates for construction sites would also be relevant for the additional transmission line construction activities associated with the installation of the Castaic-Haskell Canyon #4 circuit on existing structures, and the reconductoring of the Barren Ridge – Rinaldi (BR-RIN) transmission line between the Barren Ridge Switching Station and the Rinaldi Substation.

1.1.1 Surveying Activities

The Los Angeles Department of Water and Power (LADWP) must first obtain survey permits for the portion of the Project crossing federal lands managed by the U.S. Department of Agriculture, Forest Service (USFS) and the U.S. Department of the Interior, Bureau of Land Management (BLM), and rights-of-entry for private lands. This would include the issuance of a 50-year term Special Use Permit to LADWP by the USFS and a 30-year term (renewable) Right-of-Way Grant issued by the BLM. For survey on affected private lands, LADWP would need to negotiate rights-of-entry with the local landowners. Once survey permits are obtained, construction survey work would consist of locating the centerline, tower center hubs, ROW boundaries, and tower access roads, some of which would be located outside of the ROW boundaries. Whenever possible, location of the ROW and Project facilities would be laid out to avoid identified sensitive resources. All of these activities would begin approximately one year prior to the start of construction. Cultural resources and necessary additional threatened and endangered species intensive surveys would be conducted once the survey of the centerline and access roads is completed and clearly marked.

Necessary pre-construction geotechnical investigations would include geological field mapping of each tower site, and borings by drill rig for soil sampling and bedrock corings to determine soil densities and bedrock strength. Test locations would include angle points between the Barren Ridge Switching Station and the Angeles National Forest (ANF), and five to ten locations along the selected alignment within the ANF. Seismic analysis of tower sites for slope stability would also be necessary in mountainous areas of the ANF. Existing roads would be used as much as possible, but some new roads could be required.

1.1.2 Preconstruction Weed Removal

LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. A pre-construction weed inventory shall be conducted by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. In areas subject to ground disturbance, weed infestations shall be treated prior to construction according to control methods and practices for invasive weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated and utilized for eradication and monitoring post construction. Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator. Herbicides shall not be applied during or within 24 hours of a scheduled rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed six miles per hour. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands, respectively) with the goal of controlling populations before they start producing seeds.

1.1.3 Construction of Access Roads

The construction, operation, and maintenance of the proposed transmission line would require that heavy vehicles access tower sites along the right-of-way. Where new access roads are required, they would be constructed to support the weight of these vehicles and would typically be 16 feet wide, consisting of a 14-foot driving surface with a side drainage system between one and two feet in width. Permanent roads would be constructed where necessary for operation or maintenance, or where it is required by the landowner or land managing agency. Road standards would be addressed specifically in the Construction, Operation, and Maintenance Plan (COM Plan) and the Plan of Development (POD) during the engineering phase of the Project, and prior to a Notice to Proceed from the USFS and BLM.

Dependent upon final design and mitigation, some temporary access roads may be constructed as part of the Project. These would typically be 16 foot wide roads, but would typically have no improved ditch drainage systems. Most temporary roads would be constructed by crushing vegetation. In some areas, material and topsoil from the temporary roads would be bladed to one or both sides to facilitate rehabilitation. Following construction, bladed material can be re-spread across the disturbed road section. Seeds and roots contained within the re-spread topsoil layer normally provide a natural source for new growth.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads can be used that are located in close proximity to the proposed centerline of the transmission line, only spur roads to the tower sites would be required. New access roads and spur roads would likely be constructed into the right-of-way where existing roads do not exist. Table 1 lists the estimated ground disturbance of access and spur roads based on terrain.

TABLE 1. ACCESS AND SPUR ROAD GROUND DISTURBANCE ESTIMATES

Ground Disturbance Categories	Access Roads		Spur Roads (average width 16 feet)	
	Average Miles of Roads Per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line*	Average Miles of Roads Per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line
1. Existing roads or agricultural land; no widening anticipated	n/a	n/a	0.3	0.6
2. Existing 8 ft wide roads that require an additional 8 ft of widening	1.0 to 2.5	Permanent 0.9 to 2.4	0.3	0.6
3. Construct new road on flat terrain (0-10%)	1.0 to 2.5	Permanent 1.9 to 4.8	0.3	0.6
4. Construct new road on sloping terrain (10-20%)[1]	2.5 to 4.0	Temporary 7.3 to 11.6 Permanent 4.8 to 7.7	0.5	1.0
5. Construct new road on steep terrain (20-30%)[1, 2]	4.0 to 6.0	Temporary 23.3 to 34.9 Permanent 7.7 to 11.6	0.8	1.6
6. Construct road on very steep terrain (greater than 30%)[1, 2]	6.0 to 8.0	Temporary 69.8 to 93.1 Permanent 11.6 to 15.5	1.0	1.9

[1] After construction of the transmission line, all access roads in Categories 4 through 6 would be restored back to 16 feet wide.

[2] On steep terrain (approximately 25% or higher) with limited access on the Angeles National Forest, the USFS may require Helicopter Mitigation.

Wherever possible, roads would be built at right angles to streams and washes. Culverts or other drainage structures would be installed as necessary across drainages, but the roads would usually follow the natural grade. In addition, road construction would include dust-control and erosion control measures in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line without changing their service level. Gates would be installed where required at fenced property lines to restrict general vehicular access from or to the right-of-way. Where identified within the environmental studies for mitigation purposes, access roads may be excluded or limited within specific sensitive areas, such as Riparian Conservation Areas (RCAs) on the Angeles National Forest.

1.1.4 Clearing Right-of-Way

The clearing of some natural vegetation may be required. However, selective clearing would be performed only when necessary to provide for surveying, electrical safety clearances, line reliability, and maintenance. Trimming or removal of mature vegetation, under or near the conductors, would be done to provide adequate electrical clearance as required by the National Electrical Safety Code, the North American Electrical Reliability Corporation, and California Public Utilities Commission General Order 95 standards.

Trees that could fall onto the lines or affect lines during wind-induced line swing would be removed. Normal clearing procedures are to top or remove large trees and not disturb smaller trees. Where there is a direct conflict between trees and clearance standards, the removal of trees would be jointly reviewed and agreed upon between LADWP and the owners or managers of the property. Rights-of-way would not be chemically treated unless necessary to comply with requirements of a permitting agency. On National Forest System (NFS) lands, approved herbicides would be utilized within the Project area on select invasive plant species. Invasive plant surveys and control would continue for the life of the Project.

1.1.5 Tower Site Clearing

After access roads are developed, preparation of individual structure sites would be required to install the structures. At tower locations, work areas of up to 200 feet squared in flat terrain and up to 200 by 250 feet in areas with slopes greater than eight percent may be needed. Within the work areas, at some tower locations, a level cleared area (pad) may be necessary to complete the construction of the towers. However, many tower sites would be considerably smaller depending on the size of the tower, the terrain, resource considerations, and whether helicopter construction was used, among other factors. The work area would be required for the location of tower footings, assembly of the tower, and the necessary crane maneuvers. Vegetation would be mostly crushed, and cleared only when necessary. All pads not needed for normal transmission line maintenance would be graded to blend as near as possible with the natural contours, and revegetated where required by a permitting agency. See Table 2 for tower specifications and Table 5 for estimated temporary and permanent ground disturbance associated with the double-circuit steel lattice towers.

TABLE 2. DOUBLE-CIRCUIT STEEL LATTICE TOWER SPECIFICATIONS

Tower Placement Details	Specifications	
	Categories 1 through 3 Flat (0 – 10% slope)	Categories 4 through 6 Mountainous (10 – 30% slope)
Towers per mile	±5	±5
Average span length	1,100 ft.	1,000 ft.
Average height Ground to lowest attachment	115 ft.	105 ft.
Upper body height	52 ft.	52 ft.
Overall tower height	167 ft.	157 ft.
Typical range of heights of new towers	120 – 195 ft.	110 – 185 ft.

1.1.6 Staging Areas and Batch Plants

It is anticipated that one or two construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located centrally or near each end of the transmission line route. The staging areas would be located on previously disturbed private land and would be level and surfaced with crushed aggregate base. The LADWP would negotiate with landowners for specific locations of the staging areas.

Concrete for use in constructing foundations would be dispensed from a portable concrete batch plant located at approximately 15 mile intervals. A rubber-tired flatbed truck and tractor would be used to relocate each plant along the right-of-way. Commercial ready-mix concrete would be used when access to tower construction sites is economically feasible.

The construction yards and batch plants would be located on private land and serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, and stations for equipment maintenance. Facilities would be fenced and their gates locked. Security guards would be stationed where needed. See Table 3 for estimated ground disturbance associated with the staging sites and batch plants.

TABLE 3. STAGING SITES AND BATCH PLANT GROUND DISTURBANCE ESTIMATES

Disturbance Description	Categories 1 through 3 Flat (0 – 10% slope)*	
	Maximum Estimated Disturbance Dimension per site	Average Disturbance
Material staging sites (2 sites)	400 x 540 ft. (5 acres)	N/A
Concrete batch plants (3 sites maximum)	2 acres, 30 mile haul distance	0.2 acre per mile
Total Average Disturbance	**0.2 acre per mile**	

*Material staging sites and concrete batch plants would not be built on terrain above 10% slope.

1.1.7 Foundation Installation

Tower foundations for the lattice structures would consist of drilled concrete piers. The foundation process would start with the boring of four holes for each lattice structure or one hole for each TSP. The holes would be bored using truck- or track-mounted excavators with various diameter augers to match diameter and depth requirements of the foundation sizes.

For a typical suspension lattice tower, each hole would typically be four feet in diameter and 25 feet deep, depending on soil conditions. For the larger angle or dead-end structures, foundations could be up to 30 or more feet deep, depending on soil conditions. Each foundation would extend above the ground line between six inches and four feet. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation. Refer to Figure 1 and Figure 2 for typical foundation details for double-circuit towers.

Following excavation of the foundation holes, each footing would be constructed by placing formwork, reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Reinforcing steel cages would be assembled at laydown yards and delivered to each structure location by flatbed truck. Spoil material would be spread around the tower site and used for fill where suitable. The foundation excavation and installation would require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks. Typical suspension structures would require approximately 25 to 40 cubic yards of concrete and dead-end structures would require approximately 120 cubic yards of concrete.

FIGURE 1. TYPICAL FOUNDATION DESIGN FOR THE DOUBLE-CIRCUIT STEEL LATTICE TOWERS

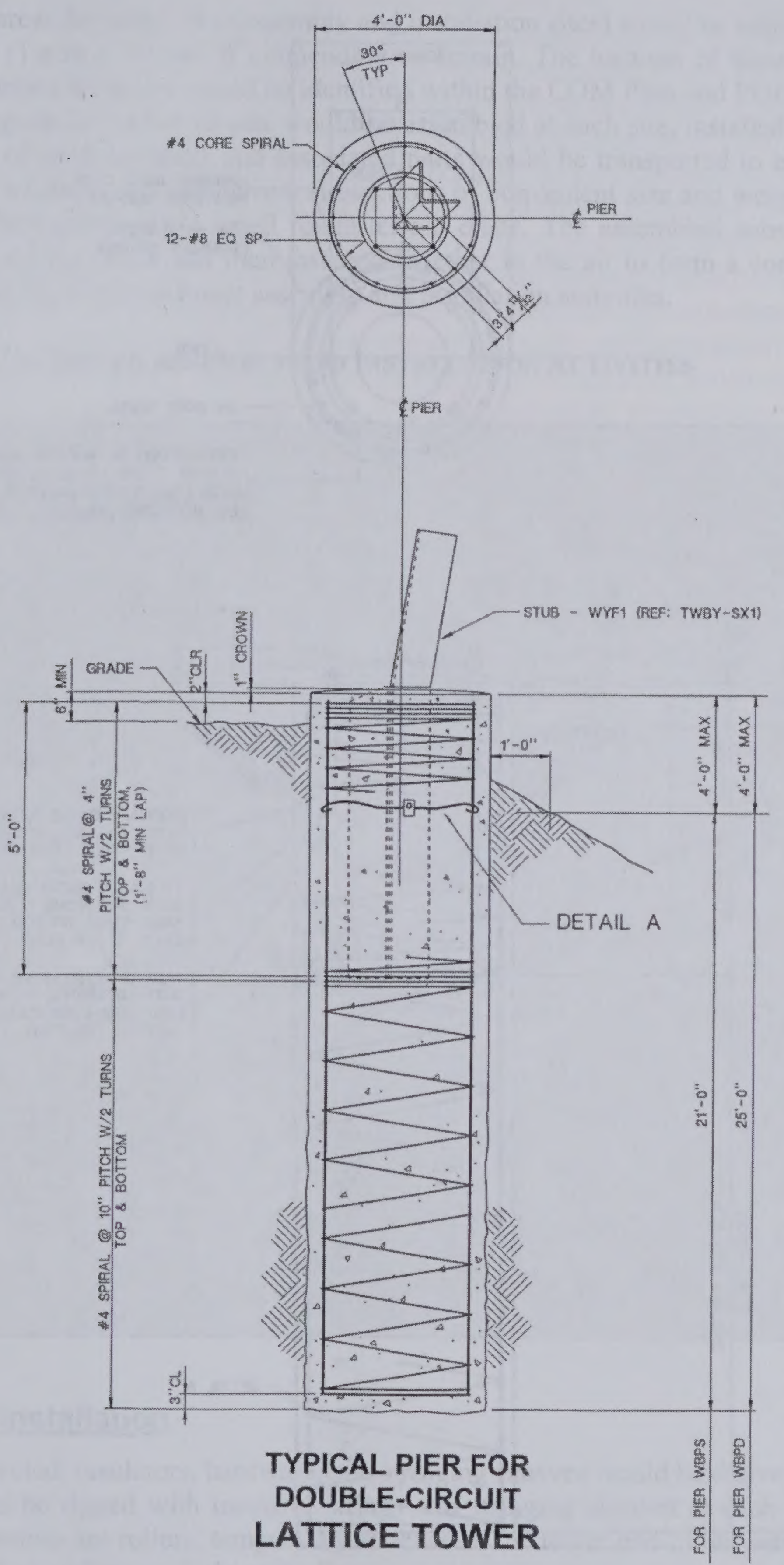
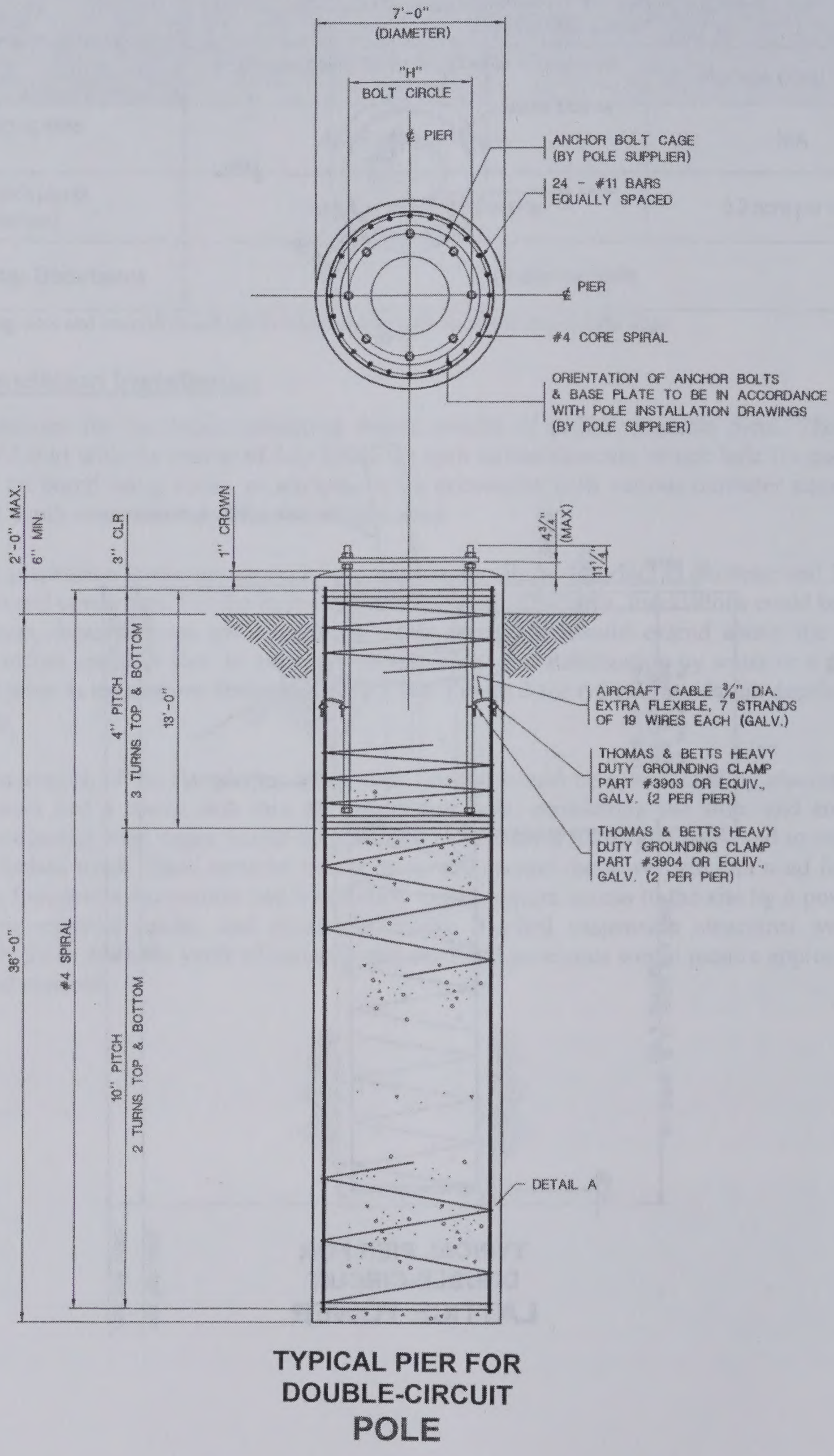

4'-0" DIA
30° TYP
#4 CORE SPIRAL
12-#8 EQ SP
℄ PIER
3"
4½"
℄ PIER
STUB - WYF1 (REF: TWBY-SX1)
GRADE
6" MIN
2"CLR
1" CROWN
5'-0"
#4 SPIRAL @ 4" PITCH W/2 TURNS TOP & BOTTOM, (1'-8" MIN LAP)
1'-0"
4'-0" MAX
4'-0" MAX
DETAIL A
#4 SPIRAL @ 10" PITCH W/2 TURNS TOP & BOTTOM
21'-0"
25'-0"
3"CL
FOR PIER WBPS
FOR PIER WBPD
TYPICAL PIER FOR DOUBLE-CIRCUIT LATTICE TOWER

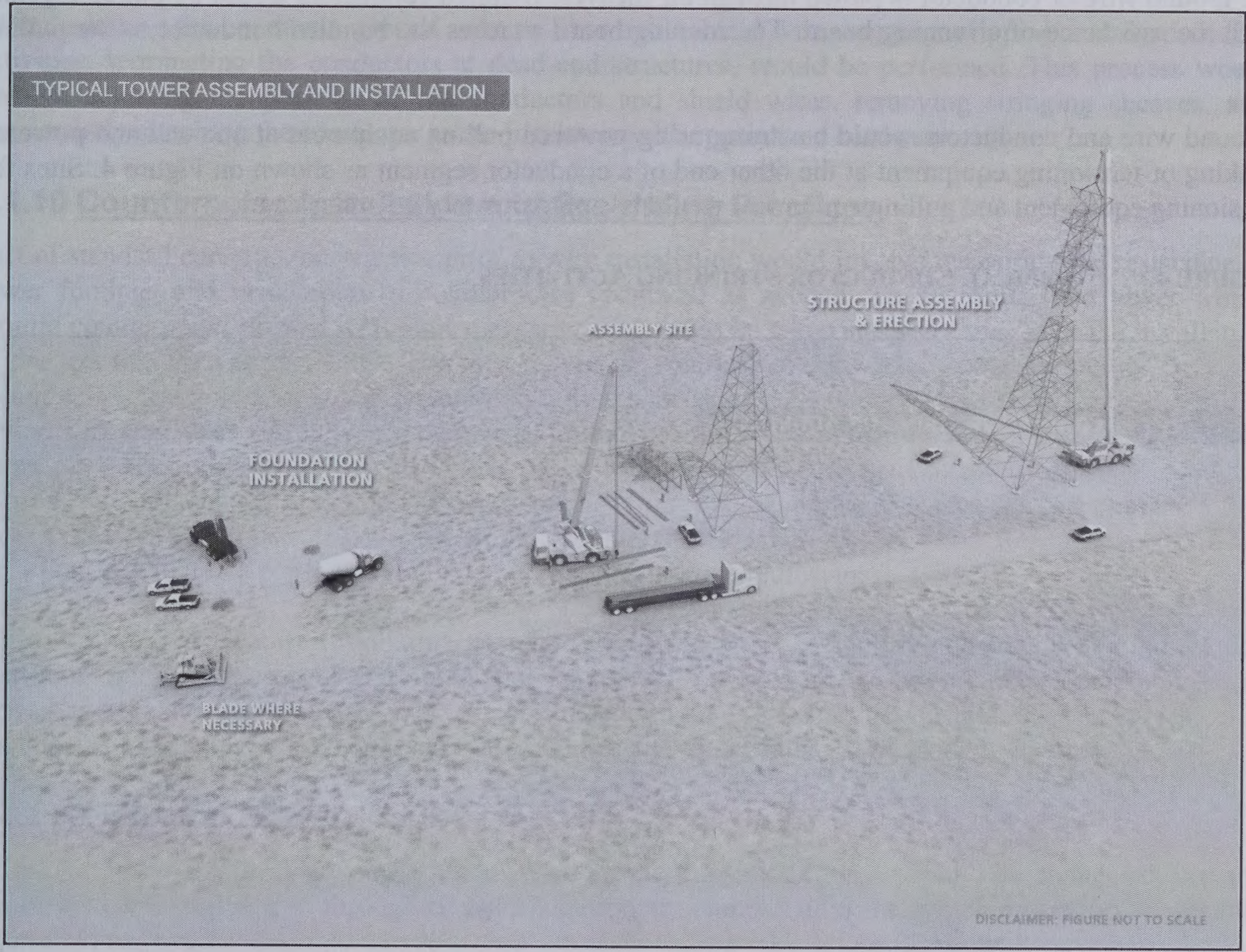
FIGURE 2. TYPICAL FOUNDATION DESIGN FOR TUBULAR STEEL POLES


7'-0"
(DIAMETER)
"H"
BOLT CIRCLE
℄ PIER
ANCHOR BOLT CAGE
(BY POLE SUPPLIER)
24 - #11 BARS
EQUALLY SPACED
℄ PIER
#4 CORE SPIRAL
ORIENTATION OF ANCHOR BOLTS
& BASE PLATE TO BE IN ACCORDANCE
WITH POLE INSTALLATION DRAWINGS
(BY POLE SUPPLIER)
2'-0" MAX.
6" MIN.
3" CLR
1" CROWN
4¾"
(MAX)
11¼"
4" PITCH
3 TURNS TOP & BOTTOM
13'-0"
AIRCRAFT CABLE ⅜" DIA.
EXTRA FLEXIBLE, 7 STRANDS
OF 19 WIRES EACH (GALV.)
THOMAS & BETTS HEAVY
DUTY GROUNDING CLAMP
PART #3903 OR EQUIV.,
GALV. (2 PER PIER)
THOMAS & BETTS HEAVY
DUTY GROUNDING CLAMP
PART #3904 OR EQUIV.,
GALV. (2 PER PIER)
36'-0"
#4 SPIRAL
10" PITCH
2 TURNS TOP & BOTTOM
DETAIL A
TYPICAL PIER FOR
DOUBLE-CIRCUIT
POLE

1.1.8 Tower Assembly and Installation

The size of the work areas for structures (assembly and installation sites) would be approximately 40,000 to 50,000 square feet (1 acre = 43,560 ft^2) depending on terrain. The location of these sites has not yet been determined, but exact locations would be identified within the COM Plan and POD prior to a Notice to Proceed from the agencies. Lattice towers would be assembled at each site, installed and bolted to the foundations. Bundles of steel members and associated parts would be transported to each tower site by truck. Steel members would be assembled into subsections of convenient size and weight on the ground. Assembly would be facilitated with a small rough-terrain crane. The assembled subsections would be erected into place by a large crane and then fastened together in the air to form a complete tower. See Figure 3 for an illustration of typical tower assembly and installation activities.

FIGURE 3. TYPICAL TOWER ASSEMBLY AND INSTALLATION ACTIVITIES


TYPICAL TOWER ASSEMBLY AND INSTALLATION
STRUCTURE ASSEMBLY & ERECTION
ASSEMBLY SITE
FOUNDATION INSTALLATION
BLADE WHERE NECESSARY
DISCLAIMER: FIGURE NOT TO SCALE

1.1.9 Conductor Installation

After the towers are erected, insulators, hardware, and stringing sheaves would be delivered to each tower site. The towers would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position. Sheaves are rollers, temporarily attached to the lower end of the insulators that allow the conductor to be pulled, or “strung,” along the line.

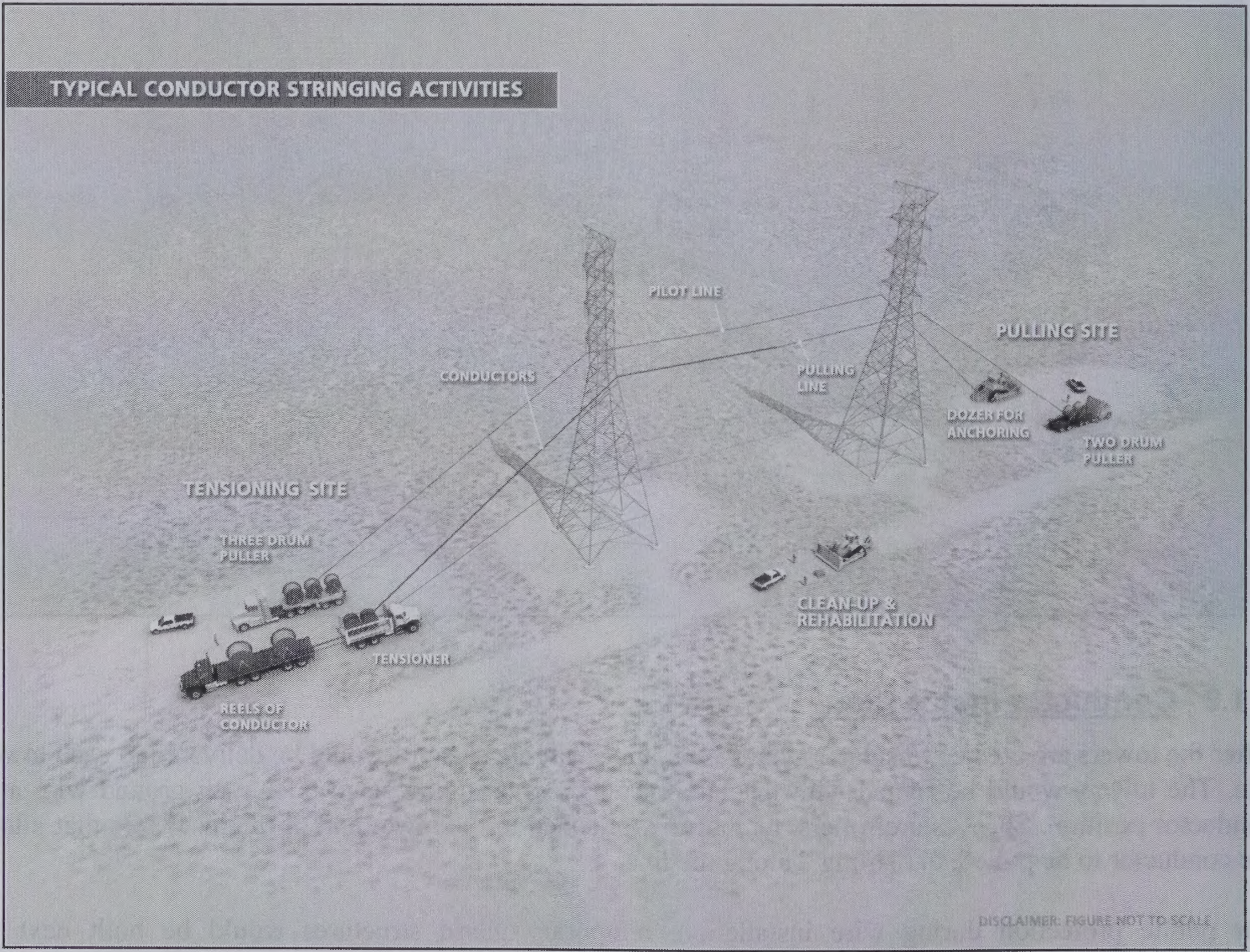
For public protection during wire installation, temporary guard structures would be built next to highways, railroads, power lines, structures, and other major obstacles. Guard structures would consist of

H-frame poles placed on either side of an obstacle. These structures would prevent ground wire, conductor, or equipment from falling on an obstacle. Equipment for installing guard structures would include augers, line trucks, pole trailers, and cranes. A guard structure would be anticipated to be necessary every five miles. The amount of ground disturbance would typically be 200 feet by 300 feet. The guard structures would be left in place until conductors and ground wires were strung, tensioned and clipped; this time frame would be approximately three weeks or longer depending on conditions. Guard structures may not be necessary for small roads. In such cases, other safety measures, such as barriers, flagmen, or other traffic control, would be used.

Pilot lines would be pulled (strung) from tower to tower by a helicopter and threaded through the stringing sheaves at each tower. The pilot line can be used to pull in the ground wire, but is used to pull in a larger-diameter, stronger pulling line for the conductor. The larger-diameter, stronger line—pulling line—would be attached to the conductors to pull them onto towers. This process would be repeated until the ground wire or conductor is pulled through all sheaves. Bundled conductors would be pulled together with the assistance of a running board. The running board attaches the bundled conductor to the pulling line.

Ground wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment as shown on Figure 4. Sites for tensioning equipment and pulling equipment would be approximately 2.5 miles apart.

FIGURE 4. TYPICAL CONDUCTOR STRINGING ACTIVITIES


TYPICAL CONDUCTOR STRINGING ACTIVITIES
PILOT LINE
PULLING SITE
CONDUCTORS
PULLING LINE
DOZER FOR ANCHORING
TWO DRUM PULLER
TENSIONING SITE
THREE DRUM PULLER
CLEAN-UP & REHABILITATION
TENSIONER
REELS OF CONDUCTOR
DISCLAIMER: FIGURE NOT TO SCALE

To the greatest extent practical, pulling and tensioning sites would be located within the transmission ROW. However, some pulling and tensioning sites may occur outside the ROW. The tensioning and pulling sites could be as large as 200 feet by 500 feet, however they would be limited in size depending on each specific location and what is reasonable for safe construction practices. The size of each site would be limited as much as possible and would be designed in coordination with the responsible property owner or land management agency. Depending on topography, some grading may be required at pulling and tensioning sites to create level pads for equipment. Tensioners, line trucks, wire trailers, and tractors needed for stringing and anchoring the ground wire or conductor would be located at the tensioning sites. A puller, line trucks, sag cat and tractors would be needed for pulling and temporarily anchoring the ground wire and conductor. Table 5 includes ground disturbance estimates for conductor installation (helicopter fly yards, portable helicopter landing pads, pulling and stringing sites, and sleeving and stringing operations).

After installing the conductor ground wire or fiber optic shield wire, sagging, clipping and dead-ending activities, terminating the conductors at dead-end structures, would be performed. This process would involve adjusting the position of the conductors and shield wires, removing stringing sheaves, and permanently attaching the conductor to the insulators with specialized hardware.

1.1.10 Counterpoise Installation and Grounding Practices

Part of standard construction practice prior to wire installation would involve measuring the resistance of tower footings and installation of counterpoise (grounds) as needed. To determine if a tower would require counterpoise, ground resistance measurements would be taken at towers sites after the installation of the foundations and structures. The measurements would be evaluated to determine the numbers and locations of structures requiring counterpoise. If the resistance to remote earth for each transmission tower is greater than 10 ohms, counterpoise (grounds) would be installed to lower the resistance to 10 ohms or less. Counterpoise would consist of a bare copper-clad or galvanized steel cable buried a minimum of 12 inches deep, extending horizontally from one or more tower legs for approximately 200 feet. Typical counterpoise installation would include two installations per structure on opposite tower legs. Four installations per tower could be required in certain circumstances.

In addition to counterpoise installation, standard grounding practices during construction would include both temporary and permanent grounding of equipment and structures, such as fences or pipelines, as necessary to reduce any potential magnetically induced voltages to harmless levels. Such practices could include electrical isolation of equipment or structures and the installation of grounding wires.

1.1.11 Switching Station Tie-in

At the proposed Haskell Canyon Switching Station, the transmission lines would be connected into and out of the switching station through dedicated station structures within the switching station, commonly referred to as "bus."

1.2 UPKEEP OF CONSTRUCTION SITES

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the line. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. No open burning of construction trash would occur without agency approval.

Microtrash would be cleaned daily from all work areas within known California condor habitat. Microtrash is a term used to describe small bits of debris like bottle caps, rags, screws, bolts, wires, glass, and other materials found in condor habitat.

1.3 HAZARDOUS MATERIALS WITHIN THE PROJECT AREA

Petroleum products such as gasoline, diesel fuel, helicopter fuel, crankcase oil, lubricants, and cleaning solvents would be present within the Project area during construction. These products would be used to fuel, lubricate, and clean vehicles and equipment. These products would be containerized by fuel trucks or by approved containers. When not in use, hazardous materials would be properly stored to prevent drainage or accidents.

Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment shall be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.

All construction, operation, and maintenance activities would comply with all applicable federal, state, and local laws and regulations regarding the use of hazardous substances.

The construction or maintenance crew foreman would insure that all applicable laws are obeyed. In addition, an on-site inspector would be present during construction to make sure that all hazardous materials are used and stored properly. A health and safety plan would be developed as part of the COM Plan and POD during the engineering and preconstruction phase of the Project.

1.4 SITE RECLAMATION

The ROW, including temporary construction sites, and any temporary ground disturbance outside of the ROW that may have been caused during or due to the construction of the Project (e.g., temporary access roads, staging sites, assembly yards) would be restored as required by the property owner or land management agency. All practical means would be used to restore the land to its original contour and to restore natural drainage patterns along the ROW. Because revegetation would be difficult in many areas of the Project where precipitation is minimal, it would be important to minimize disturbance during construction. All practical means would be used to increase the chances of vegetation reestablishment in disturbed areas.

The total construction period would be approximately two years. The COM Plan that would be completed during the engineering and preconstruction phase of the Project would address specific site reclamation of all disturbed areas.

1.5 FIRE PROTECTION

A Fire Management Plan would be developed for the Project and all applicable fire laws and regulations would be observed during the construction period. All personnel would be advised of their responsibilities under the applicable fire laws and regulations, including taking practical measures to report and suppress fires.

1.6 CONSTRUCTION MONITORING

An approved compliance program would be developed to address mitigation requirements associated with the avoidance of sensitive plant and animal species, cultural sites, or other sensitive features located

within or adjacent to the Project. Prior to construction, these measures will be described in detail and included in the POD.

1.7 THREE-CIRCUIT TOWER MITIGATION

A temporary transmission line would be constructed to keep the BR-RIN circuit energized during construction of the three-circuit towers. After the temporary line is constructed, the existing BR-RIN single-circuit towers would be removed to allow the new three-circuit towers to be constructed within the existing ROW. Once construction of the three-circuit towers is completed, the temporary transmission line would be removed.

The temporary transmission line would be 7.5 miles long and would consist of wood and steel single poles with an average height of 95 feet, a 3-foot by 3-foot footprint, and an average of eight poles per mile. Construction would occur within a temporary 80- to 100-foot ROW. Refer to Table 4 for specifications and to Table 5 for ground disturbance estimates. The majority of the temporary transmission line would be constructed along San Francisquito Road. Portions would also be constructed along Elizabeth Lake Road and Johnson Road. Pole placement would be adjacent to public roadways wherever possible. If necessary, temporary ROW on private property would be needed where poles could not be placed within public road ROW. The majority of poles would be direct-embedded when set in place and would not require a permanent foundation. Where additional strength is necessary at larger angle points, steel poles would be required, which could require an excavation approximately 6 feet in diameter by 20 feet deep to accommodate the concrete pier foundation that would be cast in place. Once all the poles have been constructed and the conductor installed, the existing BR-RIN circuit would be connected into the temporary line and energized. The construction would require establishment of a staging area, work areas around poles, and pull and tension sites. Access to pole sites and pull and tension sites would be from the adjacent roadways.

Approximately seven miles of the existing BR-RIN single-circuit towers would be removed, with existing ROW utilized to access the existing towers. The new three-circuit towers would be placed within the existing ROW, utilizing existing access roads. Helicopter Mitigation, as described in this section below, would be applied in steeper terrain crossing the Angeles National Forest if additional access is required. If additional access roads, considered to be longer than 300 feet, are necessary, specific locations and construction method (either helicopter or conventional) would be coordinated with the USFS. The new three-circuit tower would require a 25-foot by 30-foot structure footprint and an average of seven structures per mile; the average structure height would be 170 feet, with a maximum tower-to-tower span length of 780 feet. Structures would be installed in the same locations as the existing BR-RIN structures within the limits of standard tower design. The construction process for the new three-circuit towers would be the same as the double-circuit towers discussed above. After completion of construction of the three-circuit towers, the temporary transmission line would be removed and all temporary staging and work area land disturbances would be restored as close to previous conditions as possible and revegetated as required. Restoration practices would be consistent with Section 1.11 Decommissioning of Transmission Lines.

TABLE 4. THREE-CIRCUIT TOWER SPECIFICATIONS

Tower Placement Details	Specifications	
	Triple-Circuit	Temporary Transmission Line
ROW acquisition	None (within existing)	80-100 ft
Structures per Mile	7	8
Average span length	750 ft	650 ft

Tower Placement Details	Specifications	
	Triple-Circuit	Temporary Transmission Line
Average height (ft) Ground to lowest attachment	120	60
Upper body height	50	45
Overall tower height	170	105
Typical range of heights of new towers	150 - 180 ft.	95 - 105 ft.

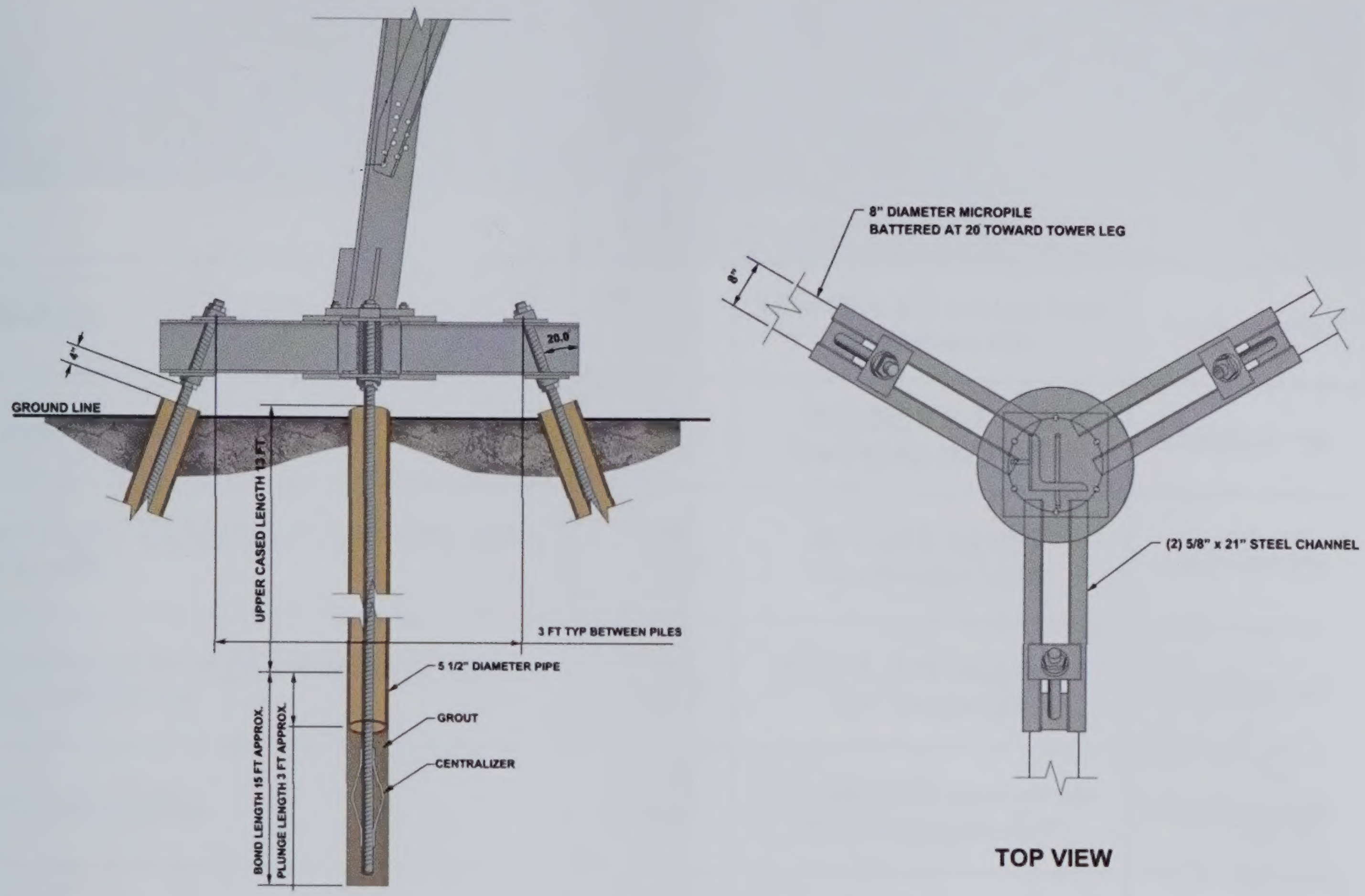
1.8 HELICOPTER MITIGATION

The following sites and ground disturbing construction activities would be required to construct the new transmission line within the identified helicopter construction areas: portable landing pads, helicopter fly yards/staging areas and associated temporary access roads, tower structure vegetation clearing, guard structures at major crossings, and access road pullouts. Refer to Table 5 for ground disturbance estimates for the Helicopter Mitigation.

The transmission line materials (tower steel, conductor reels, structure hardware, etc.) would be delivered by truck to the helicopter fly yards/staging areas. Vegetation clearing may be required at these sites to ensure safe working conditions. The fly yards/staging areas would serve as helicopter support yards for fueling and maintenance, as well as for the transport of materials and personnel. Towers may also be assembled in sections at these yards prior to delivery to the tower sites. Heavy lift helicopters would then fly the towers from the yards to the tower sites.

Portable landing pads would be located at each tower site. These pads would allow helicopters to load and unload personnel, tools, and equipment necessary for construction of foundations and assembly of tower structures. Helicopter-constructed towers that would not be in close proximity to existing access roads would utilize micropile foundations. For each tower leg, micropile foundations would use a group of three to eight 6- to 9-inch diameter casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth anywhere from one to eight feet below the ground surface, depending on the terrain. Figure 5 illustrates the plan view and sections of a micropile foundation.

FIGURE 5. MICROPILE FOUNDATION


4"
20.0
GROUND LINE
UPPER CASED LENGTH 13 FT.
3 FT TYP BETWEEN PILES
5 1/2" DIAMETER PIPE
GROUT
CENTRALIZER
BOND LENGTH 15 FT APPROX.
PLUNGE LENGTH 3 FT APPROX.
8" DIAMETER MICROPILE
BATTERED AT 20 TOWARD TOWER LEG
8"
(2) 5/8" x 21" STEEL CHANNEL

LATTICE TOWER LEG SUPPORT

TOP VIEW

Conductor installation would proceed as for double-circuit tower installation. The equipment necessary for conductor installation would be large, heavy construction equipment that could only be brought in by truck. Some NFS roads could need maintenance or improvement to allow pulling and tensioning, but no new access or spur roads would be created for conductor installation on the helicopter-constructed towers.

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TABLE 5 GROUND DISTURBANCE ESTIMATES FOR THE PROPOSED 230 KV DOUBLE-CIRCUIT TRANSMISSION LINE

Disturbance Description	Double-Circuit Steel Lattice Towers with Helicopter Stringing of Conductors		Three-Circuit Tower Mitigation (Three-Circuit Steel Lattice Towers with Helicopter Stringing of Conductors)				Helicopter Mitigation (Steel Lattice Towers with Helicopter Installation of Towers and Conductors)	
			Three-Circuit		Temporary Transmission Line			
	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance
	Temporary Disturbance During Installation							
Tower installation	200 x 200 ft. (0.9 acre) per tower ±5 towers per mile[1]	4.6 acres per mile	200 x 200 ft. (0.9 acre) per tower ±7 towers per mile	6.4 acres per mile	50 X 100 ft. (0.1 acre) per tower ±8 towers per mile	0.9 acre per mile	100 x 100 ft. (0.2 acre) per tower ±5 towers per mile	1 acre per mile
Guard structures at major crossings	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acre per mile	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acre per mile	40 X 100 ft. (0.09 acres) One crossing every 5 miles	0.02 acre per mile	200 x 300 ft. (1.3 acres) One crossing every 5 miles	0.3 acre per mile
Helicopter fly yards / staging areas (includes fueling station at one of the sites)	200 x 200 ft(0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 ft (0.9 acre) One site every 5 miles	0.2 acre per mile	200 x 200 ft (0.9 acre) One site every 5 miles	0.2 acre per mile	650 x 650 ft. (10 acres) One site every 5 miles	2 acres per mile
Landing area/Portable helicopter landing pads (includes vegetation clearing for site)	50 x 50 ft(0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft (0.06 acre) per site One site every 3.5 miles	0.02 acre per mile	50 x 50 ft. (0.06 acre) per site Five sites per mile	0.3 acre per mile
Pulling and tensioning sites	200 x 500 ft (2.3 acres) per site One site every 2.5 miles[2]	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile	200 x 500 ft (2.3 acres) per site One site every 2.5 miles**	0.9 acre per mile
Sleeving and miscellaneous stringing operations	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile	50 x 100 ft (0.1 acres) per site One site every 2.5 miles	0.05 acre per mile	100 x 200 ft. (0.5 acre) per site One site every 2.5 miles	0.2 acre per mile
Total Average Temporary Disturbance[3]	**6.2 acres per mile**		**8 acres per mile**		**2.1 acres per mile**		**3.7 acres per mile**	
	Permanent Disturbance							
Tower sites, including vegetation clearance within a 10-foot radius around base of towers in accordance with state law	60 X 60 ft (0.08 acres) ±5 towers per mile	0.2 acre per mile	45 x 50 ft. (0.05 acre) ±7 towers per mile	0.14 acre per mile	N/A	N/A	60 x 60 ft. (0.08 acre) ±5 towers per mile	0.2 acre per mile
Total Average Permanent Disturbance[4]	**0.2 acre per mile**		**0.14 acre per mile**		**N/A**		**0.2 acre per mile**	

Information based on LADWP and POWER Engineers, Inc. estimates. Actual disturbance areas may be smaller based on final engineering design.

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[1] For slopes over 10% (ground disturbance categories 4-6), site dimensions would be 200 x 250 ft. (1.2 acres) and have an average disturbance of 5.8 acres per mile.

[2] For slopes over 10% (ground disturbance categories 4-6), sites would be every 2 miles and have an average disturbance of 1.2 acres per mile.

[3] Access and spur road disturbances included in Table 1.

[4] Ibid.

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1.9 OPERATION OF TRANSMISSION LINES

The nominal voltage for the BRRTP transmission line would be 230 kV AC. There may be minor variations of up to five percent above the nominal level depending upon load flow.

1.9.1 Permitted Uses

After the transmission line has been energized, land uses that are compatible with safety regulations (such as agriculture and grazing) would be permitted in and adjacent to the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses on public lands that comply with local regulations would be permitted adjacent to or within the ROW, with require approval from the appropriate agency. Permission to use the ROW on private lands would have to be obtained from the utility owning the transmission line.

1.9.2 Safety

Safety is a primary concern in the design of this 230 kV transmission line. The AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the switching station would be grounded. All fences, metal gates, pipelines, and other metal components that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside of the ROW may also occur.

1.10 MAINTENANCE OF TRANSMISSION LINES

The 230 kV transmission line would be inspected several times annually by both ground and air patrols. Maintenance would be performed as needed. When access is required for non-emergency maintenance and repairs, LADWP would adhere to the same precautions and procedures that were taken during the original construction.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged equipment or infrastructure. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance. Restoration procedures following completion of repair work would be those prescribed for project implementation construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Details would be provided in the COM Plan and POD prior to line construction.

1.10.1 Vegetation Management

Vegetation management along the transmission line ROW would be required by the North American Reliability Council (NERC). In compliance with the NERC's Standard FAC-003-l, LADWP would prepare a Vegetation Management Plan for the BRRTP. The Vegetation Management Plan would be included in the COM Plan to be completed prior to the issuance of a Notice to Proceed from the USFS and BLM. Vegetation management would consist of routine tree trimming to maintain the required minimum 10-foot clearance from conductors to vegetation (California Public Resources Code [PRC] 4293); clearance of flammable brush vegetation within a 10-foot radius around the base of transmission line towers in accordance with California PRC 4292; and clearance immediately adjacent to access roads to permit adequate access to the facilities.

1.10.2 Access Road Maintenance

Ongoing access road maintenance would be conducted in accordance with existing or new road authorizations issued to LADWP. Access road maintenance consists of those activities necessary to allow continued access to the ROW and/or each tower structure. These activities may include grading, and maintenance of drainage systems, bridges, culverts, fences, gates and signs. Motor graders, backhoes, dump trucks and pickups are used to maintain access roads.

1.11 DECOMMISSIONING OF TRANSMISSION LINES

At the end of the useful life of the proposed Project, if the facility were no longer required, or if extension of the authorizations were not granted by federal land agencies at the time they expired, the transmission line would be abandoned. Subsequently, conductors, insulators and hardware would be dismantled and removed from the ROW. Tower structures would be removed and foundations broken off below ground surface.

If the line and associated ROW are abandoned at some future date, the ROW would be available for the same uses that existed prior to construction of the Project. Following abandonment and removal of the transmission line from the ROW, any areas disturbed to dismantle the line would be restored and rehabilitated as near as possible to their original condition.

2.0 ADDITION OF NEW 230 KV CIRCUIT

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures (towers 1-1 through 12-1). This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (2,156 kcmil "Bluebird" ACSS/AW) as that proposed for the new 230 kV transmission line between Barren Ridge and Haskell Canyon Switching Stations.

The addition of a new circuit on existing towers would require many of the same activities of a new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). However, all work would be within existing ROW and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor. Specific towers requiring reinforcement would be determined following detailed design of the Project. Tower reinforcement would not alter the general design or the location of the structures. This process would generally include reinforced foundations or steel member replacements.

3.0 RECONDUCTORING

LADWP proposes the reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line with larger conductors between the Barren Ridge Switching Station and Rinaldi Substation (towers 176-1 through 251-1). The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor. The new conductor would have a larger diameter that allows for greater electrical capacity.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). Removal of the existing conductor would be used to string a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing 250-foot-wide ROW, with no additional ROW required. Some of the towers would need to be modified, replaced, and/or have foundations reinforced or replaced to carry the additional weight of the new heavier conductor.

4.0 NEW HASKELL CANYON SWITCHING STATION

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge-Haskell Canyon, existing Castaic-Northridge, Castaic-Sylmar, Castaic-Olive, and the proposed Castaic to Haskell Canyon).

The station would be approximately 500 feet by 600 feet to accommodate the necessary circuit positions, which are made up of equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide and would be enclosed by chain-link fencing with barbed-wire extension for security. Figure 6 illustrates the preliminary design layout for the station. Figure 7 illustrates the preliminary grading plan for the station.

Necessary pre-construction geotechnical investigation on-site would include six borings by a drill rig to investigate bedrock and soil stability and four cone penetration test locations after site grading to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. Construction would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut and fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. A 16-foot wide paved road and 100-foot by 100-foot gravel parking area would be required. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 120-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would be terminated into the switching station (i.e., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would need support and

require the installation of galvanized steel structures. An existing 115 kV transmission line may need to be relocated around the proposed station. High-voltage bus work consisting of aluminum jumpers and tubing would be installed within the station.

FIGURE 6. HASKELL CANYON SWITCHING STATION DESIGN LAYOUT

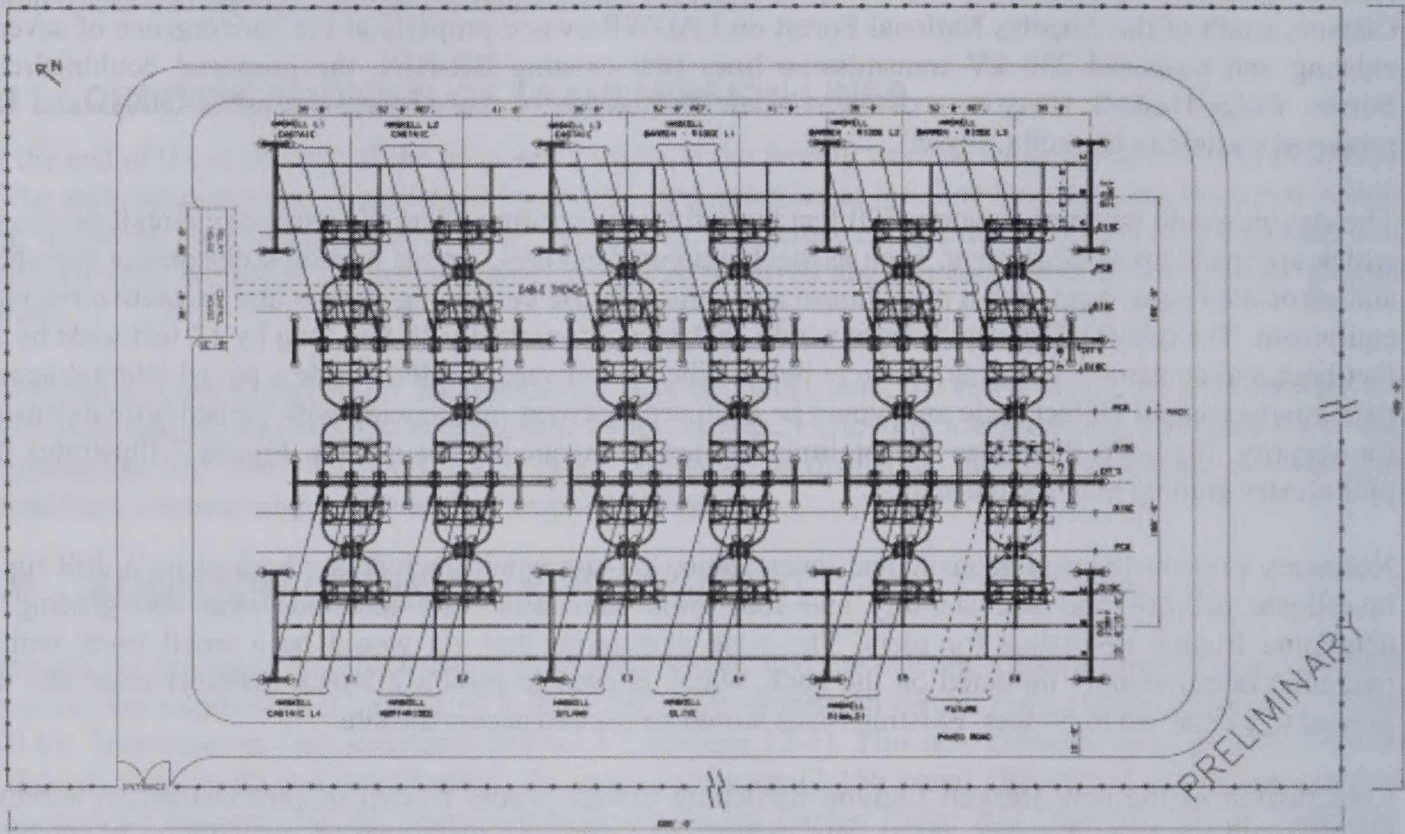
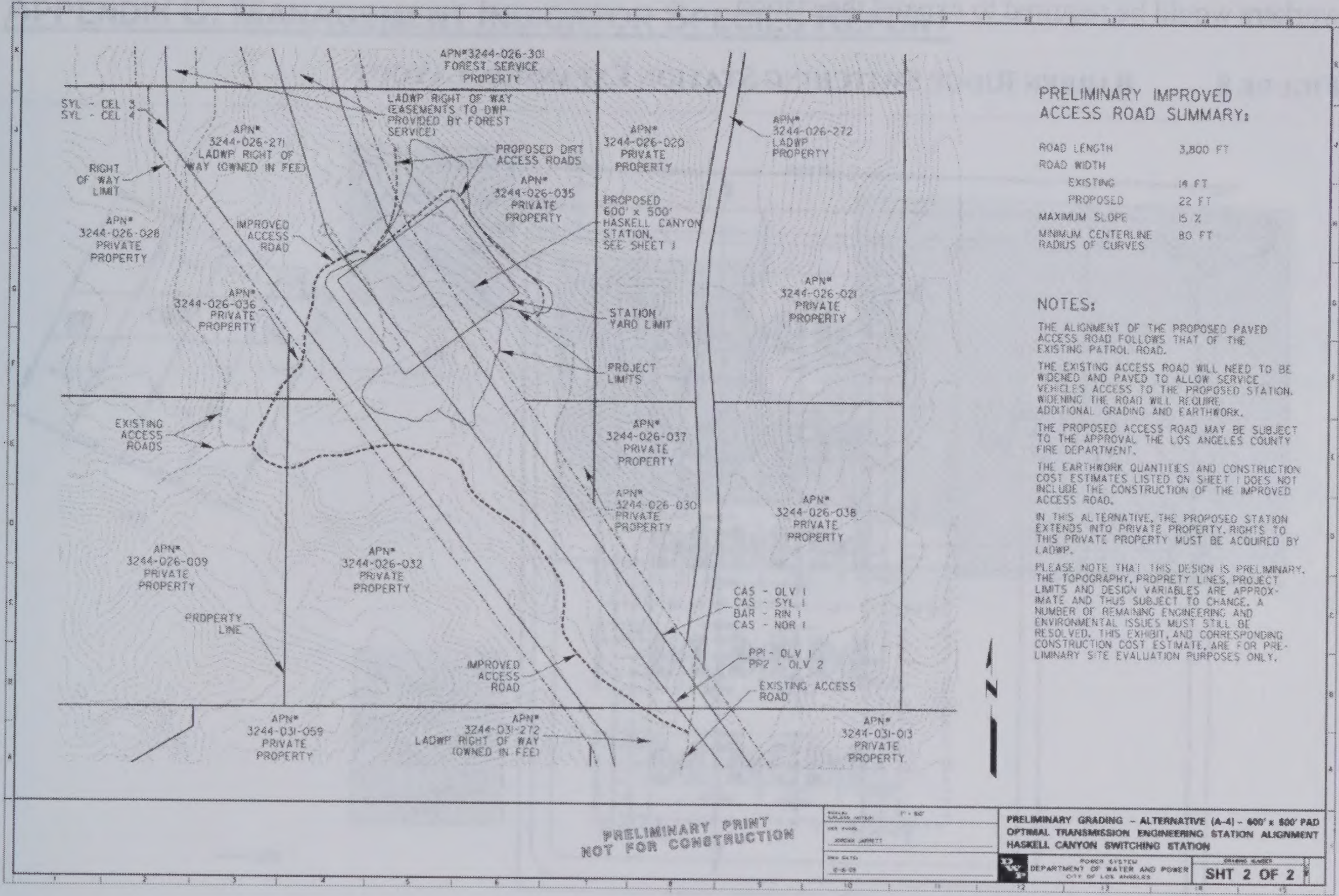

N
HASKELL L1 CASTAIC
HASKELL L2 CASTAIC
HASKELL L3 CASTAIC
HASKELL BARREN - RIDGE L1
HASKELL BARREN - RIDGE L2
HASKELL BARREN - RIDGE L3
CABLE TRENCH
HASKELL CASTAIC L4
HASKELL NORTHRIDGE
HASKELL SYLMAR
HASKELL OLIVE
HASKELL RINALDI
FUTURE
PAVED ROAD
PRELIMINARY

FIGURE 7. HASKELL CANYON GRADING PLAN


APN#3244-026-301 FOREST SERVICE PROPERTY
LADWP RIGHT OF WAY (EASEMENTS TO DWP PROVIDED BY FOREST SERVICE)
SYL - CEL 3
SYL - CEL 4
APN# 3244-026-271 LADWP RIGHT OF WAY (OWNED IN FEE)
RIGHT OF WAY LIMIT
PROPOSED DIRT ACCESS ROADS
APN# 3244-026-020 PRIVATE PROPERTY
APN# 3244-026-272 LADWP PROPERTY
APN# 3244-026-035 PRIVATE PROPERTY
APN# 3244-026-028 PRIVATE PROPERTY
IMPROVED ACCESS ROAD
PROPOSED 600' x 500' HASKELL CANYON STATION, SEE SHEET 1
APN# 3244-026-036 PRIVATE PROPERTY
STATION YARD LIMIT
APN# 3244-026-021 PRIVATE PROPERTY
PROJECT LIMITS
EXISTING ACCESS ROADS
APN# 3244-026-037 PRIVATE PROPERTY
APN# 3244-026-030 PRIVATE PROPERTY
APN# 3244-026-038 PRIVATE PROPERTY
APN# 3244-026-009 PRIVATE PROPERTY
APN# 3244-026-032 PRIVATE PROPERTY
PROPERTY LINE
CAS - OLV 1
CAS - SYL 1
BAR - RIN 1
CAS - NOR 1
PP1 - OLV 1
PP2 - OLV 2
IMPROVED ACCESS ROAD
EXISTING ACCESS ROAD
APN# 3244-031-059 PRIVATE PROPERTY
APN# 3244-031-272 LADWP RIGHT OF WAY (OWNED IN FEE)
APN# 3244-031-013 PRIVATE PROPERTY
N
PRELIMINARY PRINT NOT FOR CONSTRUCTION
1" = 50'
JORDAN JARRETT
6-6-09
PRELIMINARY GRADING - ALTERNATIVE (A-4) - 600' x 500' PAD
OPTIMAL TRANSMISSION ENGINEERING STATION ALIGNMENT
HASKELL CANYON SWITCHING STATION
POWER SYSTEM
DEPARTMENT OF WATER AND POWER
CITY OF LOS ANGELES
SHT 2 OF 2

PRELIMINARY IMPROVED ACCESS ROAD SUMMARY:

ROAD LENGTH	3,800 FT
ROAD WIDTH	
EXISTING	14 FT
PROPOSED	22 FT
MAXIMUM SLOPE	15 %
MINIMUM CENTERLINE RADIUS OF CURVES	80 FT

NOTES:

THE ALIGNMENT OF THE PROPOSED PAVED ACCESS ROAD FOLLOWS THAT OF THE EXISTING PATROL ROAD.

THE EXISTING ACCESS ROAD WILL NEED TO BE WIDENED AND PAVED TO ALLOW SERVICE VEHICLES ACCESS TO THE PROPOSED STATION. WIDENING THE ROAD WILL REQUIRE ADDITIONAL GRADING AND EARTHWORK.

THE PROPOSED ACCESS ROAD MAY BE SUBJECT TO THE APPROVAL THE LOS ANGELES COUNTY FIRE DEPARTMENT.

THE EARTHWORK QUANTITIES AND CONSTRUCTION COST ESTIMATES LISTED ON SHEET 1 DOES NOT INCLUDE THE CONSTRUCTION OF THE IMPROVED ACCESS ROAD.

IN THIS ALTERNATIVE, THE PROPOSED STATION EXTENDS INTO PRIVATE PROPERTY. RIGHTS TO THIS PRIVATE PROPERTY MUST BE ACQUIRED BY LADWP.

PLEASE NOTE THAT THIS DESIGN IS PRELIMINARY. THE TOPOGRAPHY, PROPRETY LINES, PROJECT LIMITS AND DESIGN VARIABLES ARE APPROXIMATE AND THUS SUBJECT TO CHANGE. A NUMBER OF REMAINING ENGINEERING AND ENVIRONMENTAL ISSUES MUST STILL BE RESOLVED. THIS EXHIBIT, AND CORRESPONDING CONSTRUCTION COST ESTIMATE, ARE FOR PRELIMINARY SITE EVALUATION PURPOSES ONLY.

5.0 EXPANSION OF BARREN RIDGE SWITCHING STATION

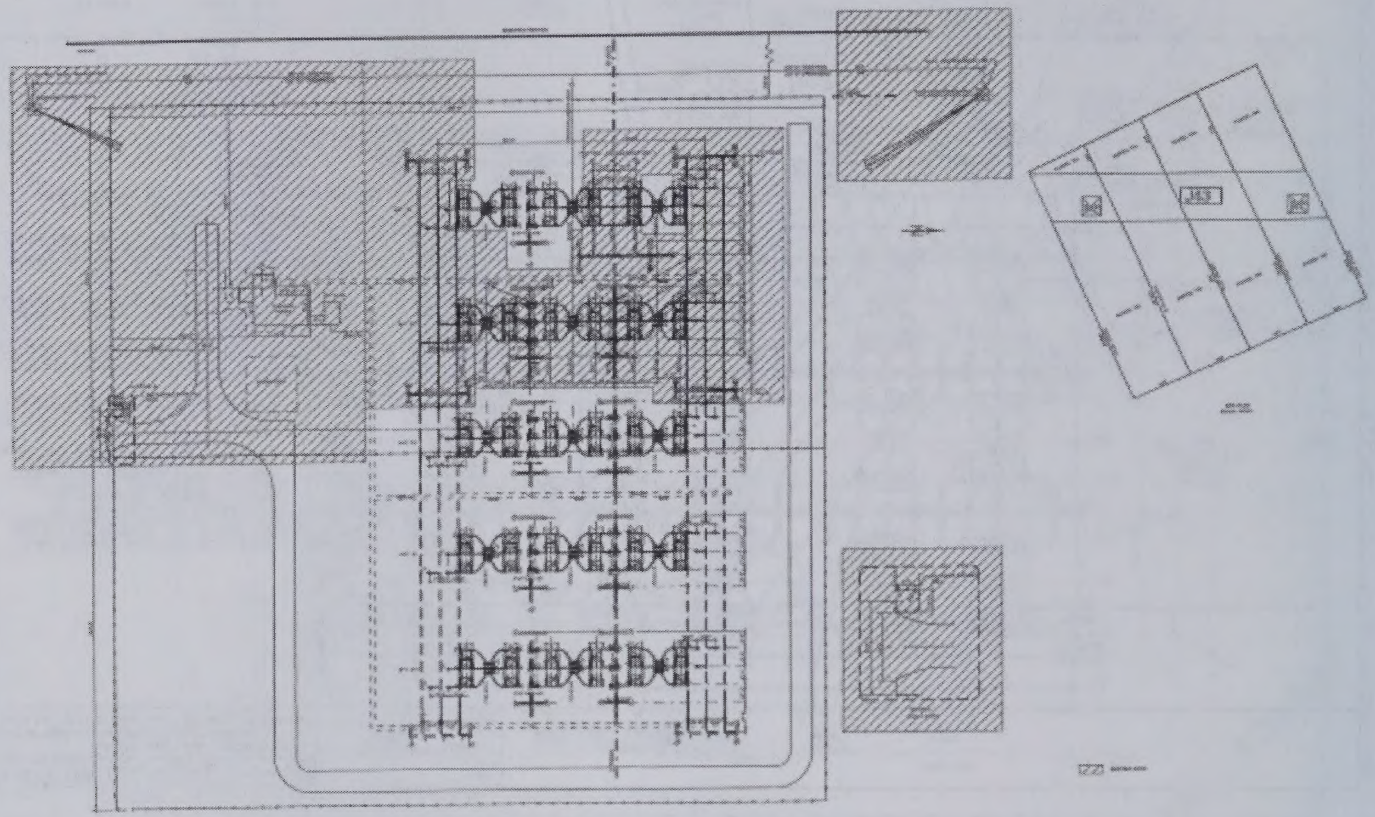
LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet by 500 feet, for a total station size of 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and drainage area. Figure 8 illustrates the preliminary design layout for the station.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station as described above. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Necessary pre-construction geotechnical on-site investigation would include two test pits excavated by a backhoe to investigate soil density and settlement, and four cone penetration test locations on-site to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

It is estimated that 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 90-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. An estimated 8 months with approximately 60 workers would be required to expand the station.

FIGURE 8. BARREN RIDGE SWITCHING STATION EXPANSION LAYOUT



APPENDIX C: MANAGEMENT INDICATOR SPECIES REPORT

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June, 2012

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER

Barren Ridge Renewable Transmission Project
Management Indicator Species Report

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POWER
ENGINEERS

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1.0 INTRODUCTION

Management Indicator Species (MIS) are selected by the U.S. Department of Agriculture, Forest Service (Forest Service) because changes in their populations and abundance are believed to indicate the effects of forest management activities (36 CFR [Code of Federal Regulations] 219.19(a)(1), 1982) and the health of various specific ecosystems or habitats, and to aid in giving direction for future monitoring (36 CFR 219(a)(6), 1982). While regulation under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) required the selection of vertebrate and/or invertebrate species as MIS, it did not exclude the selection of other, non-wildlife forms. Thus, vascular plants are included as MIS because these species are in turn often widespread and are also responsive to environmental stresses. Guidance regarding MIS set forth in the 2005 Southern California National Forest Land Management Plan (LMP) directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitats of each MIS affected by such projects, and (2) at the national forest (forest), monitor populations and/or habitat trends of forest MIS, as identified by the LMP.

The purpose of this assessment is to evaluate the potential impacts of the proposed Barren Ridge Renewable Transmission Project (BRRTP, Project) on the Management Indicator Species identified in the 2005 LMP (USFS 2005a, Part 1, page 46). The rationale for MIS selection is presented in Appendix B of the Forest Service Pacific Southwest Region Final Environmental Impact Statement (FEIS) for the LMP (USFS 2005b, Volume 2, pages 72 – 81).[1]The LMP direction is to maintain or improve habitat conditions to sustain healthy populations of MIS. This document will disclose effects associated with BRRTP to MIS habitat or individuals that could occur within the Project area.

1.1 DIRECTION REGARDING THE ANALYSIS OF PROJECT-LEVEL EFFECTS ON MIS

Project-level effects on MIS are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the Proposed Action and alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects would change the quantity and/or quality of habitat in the Project area. These Project-level impacts to habitat are then related to national forest-scale population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LMP. Hence, where the Angeles National Forest (ANF) LMP requires population monitoring or population surveys for an MIS (USFS 2005a, Part 2, page 97), the project-level effects analysis for that MIS may include additional data that is available from population monitoring data. For certain MIS, the LMP does not require population monitoring or surveys; for these MIS, project-level MIS effects analysis can be informed by forest-scale habitat monitoring and analysis alone. The Southern California LMP requirements for MIS analyzed within the ANF are summarized in Section 3 of this report.

The following steps are required to adequately analyze project effects to MIS, including Threatened, Endangered, and Sensitive (TES) species that are also MIS:

- Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Identifying the LMP forest-level monitoring requirements for this subset of forest MIS.
- Analyzing project-level effects on habitats or habitat components for this subset of forest MIS.

---

[1] Although the FEIS is part of the LMP, because both the LMP and the FEIS are split into multiple sections, for ease of referring to specific text locations in this report, the LMP and FEIS will be referred to separately and cited as "USFS 2005a" and "USFS 2005b," respectively. The LMP is split into three parts; Part 1 and Part 3 each refer to all four Southern California National Forests (Angeles, Cleveland, Los Padres, and San Bernardino). However, Part 2 is four separate documents, each referring to strategies for a separate forest. For the purposes of this document, any references to Part 2 of the LMP will be referring to the ANF Strategy specifically. The FEIS is split into two volumes which refer to all four Southern California National Forests.

- Discussing forest-scale habitat and/or population trends for this subset of forest MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends for these MIS in the forest.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USFS 2006). This MIS Report documents application of the above steps to select and analyze MIS for the BRRTP.

1.2 DIRECTION REGARDING MONITORING OF MIS POPULATION AND HABITAT TRENDS AT THE FOREST SCALE

Forest-scale monitoring requirements for the ANF MIS are found in the Monitoring Plan of the Forest Service FEIS (USFS 2005b, Volume 2, pages 72 – 81).

1.2.1 Habitat Status and Trends

The LMP (USFS 2005a, Part 2, page 97) requires forest-scale monitoring of habitat status and trend for select MIS on the ANF. For MIS with habitat potentially affected by BRRTP, these habitat monitoring requirements are summarized in Table 1 and Table 2 of this report. Habitat status is considered the current amount of habitat for each MIS on ANF. Habitat trend is the direction of change in the amount of habitat between the time the LMP was approved and the present. The methodology for assessing habitat status and trend is described in detail in the ANF MIS Report (USFS 2008).

Habitats are the vegetation types (e.g., mixed conifer forest) and/or ecosystem components (e.g., cliffs or lakes) and any special habitat elements (e.g., snags) required by an MIS for breeding, cover and/or feeding. Required habitat is identified using habitat relationships data or models. In the case of MIS that are also federally threatened or endangered, or Forest Service sensitive species that have been studied in detail, this information will be considered as part of the analysis. Detailed information on the habitat relationship for MIS on the ANF can be found in the ANF MIS Report (USFS 2008). MIS habitat trend is monitored using ecological and vegetation data for the ANF.

1.2.2 Population Status and Trend

Population monitoring requirements for the MIS of the Southern California National Forests are identified in the Monitoring Information of the Forest Service FEIS (USFS 2005b, Volume 2, pages 77 – 78). This monitoring is intended to answer the question "Are trends in resource conditions indicating that habitat conditions for fish, wildlife and rare plants are in an upward trend?" Population status is the current condition of the MIS related to the type of monitoring data (population measure) required in the LMP for that MIS. Population trend is the direction of change in that population measure over time.

The LMP requires monitoring of population status and trend for select MIS on the ANF as shown in Table 2 (USFS 2005a, Part 2, page 97). There are many types of population data, and this document also identifies the type of population monitoring data required for each MIS. All population monitoring data are collected and/or compiled at the forest scale, consistent with the ANF LMP.

Population data for MIS are collected and consolidated by the ANF in cooperation with State and federal agency partners (including the California Department of Fish and Game [CDFG], U.S. Geological Survey [USGS], and U.S. Department of the Interior Fish and Wildlife Service [USFWS]) or conservation partners (including Partners in Flight and various avian joint ventures). Population data includes presence data, which is collected using population surveys, bird point counts, number of hunter kills, and counts of species sign (such as deer pellets). The ANF's MIS monitoring program for species typically hunted, fished, or trapped was designed to be implemented in cooperation with CDFG, consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with State fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as range-wide, State, province (Southern California), or important species management unit (e.g., Deer Assessment Unit or waterfowl migratory routes). Population data at various scales are important to both assess and provide meaningful context for population status and trend at the forest scale.

Where populations are monitored, the monitoring design will result in data that can provide conclusions at a broad landscape scale for the province. For the 12 Forest MIS, the Forest Service FEIS (USFS 2005b, Volume 2, pages 77 – 78) does not limit monitoring efforts to population monitoring, but instead allows for habitat monitoring and analysis. For the MIS with habitat potentially affected by BRRTP, the population monitoring requirements are summarized in Table 1 and Table 2 of this report.

2.0 MIS SELECTED FOR PROJECT ANALYSIS

MIS for the ANF are identified in the Forest LMP (USFS 2005a, Part 1, page 46). The MIS analyzed for the proposed BRRTP within the ANF were selected from this list of MIS identified in the LMP, as indicated below in Table 1. In addition, Table 1 identifies the management issue associated with the MIS, method of measurement, monitoring method, and whether or not the MIS is potentially affected by the Project according to its habitat and population status within the Project area.

TABLE 1. MANAGEMENT INDICATOR SPECIES FOR THE ANGELES NATIONAL FOREST AND RELEVANCE TO THE PROJECT

SPECIES AND ASSOCIATED HABITAT TYPE	MANAGEMENT ISSUE	METHOD OF MEASUREMENT	MONITORING METHOD	CATEGORY AND RELEVANCE TO PROJECT
Mule Deer (All habitat types)	Vegetation diversity and age class mosaics; roads and recreation effects	Trend in abundance and/or habitat condition	Herd composition in cooperation with CDFG; habitat condition	Category 3
Mountain Lion (All habitat types)	Landscape linkages; habitat fragmentation	Trend in distribution, movement, and/or habitat conditions	Studies in cooperation with CDFG, USGS	Category 3
Arroyo Toad (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trends in abundance, distribution, and/or habitat conditions	Population abundance and/or habitat condition in selected locations	Category 3
Song Sparrow (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trend in abundance and/or habitat condition	Riparian bird species point counts and/or habitat condition	Category 3
Blue Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA* data	Category 1
Valley Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Englemann oak (oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Coulter pine (Chaparral and conifer ecotone)	Drought/beetle related mortality and lack of fire	Trend in age/size class distribution	FIA data/ aerial photo monitoring	Category 1

SPECIES AND ASSOCIATED HABITAT TYPE	MANAGEMENT ISSUE	METHOD OF MEASUREMENT	MONITORING METHOD	CATEGORY AND RELEVANCE TO PROJECT
Bigcone Douglas-fir (Chaparral and conifer ecotone)	Altered fire regimes (fire severity and/or fire return interval)	Trend in extent of vegetation type	FIA data/ aerial photo monitoring	Category 1
California spotted owl (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Occupied territories and/or habitat condition	Forest Service Region 5 protocol	Category 3
Black oak (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in abundance, size class distribution	FIA data	Category 1
White Fir (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in size class distribution	FIA data	Category 1

*Forest Inventory and Analysis Program

Category 1: MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to the project area, but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

The MIS whose habitat would be either directly or indirectly affected by the BRRTP, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the Proposed Action and alternatives on the habitat of these MIS. The MIS selected for Project-level MIS analysis for the BRRTP are: mule deer, mountain lion, arroyo toad, song sparrow, and California spotted owl. All other MIS are considered Category 1 and will not be discussed further in this analysis due to a lack of suitable habitat or occurrences within the Project area, indicating that they will not be impacted by the construction of the BRRTP. These MIS are: blue oak, valley oak, Englemann oak, Coulter pine, bigcone Douglas fir, black oak, and white fir.

3.0 MONITORING REQUIREMENTS FOR MIS SELECTED FOR PROJECT-LEVEL ANALYSIS

The Forest Service FEIS (USFS 2005b, Volume 2, pgs 72 – 81) identifies forest-scale habitat and population monitoring requirements for the ANF MIS. This information is also displayed in Table 1. Habitat and population monitoring results for the ANF MIS are described in the ANF MIS Report (USFS 2008) and are summarized in Table 2 below for the MIS that could be affected by the BRRTP.

3.1 HOW MIS MONITORING REQUIREMENTS ARE BEING MET

For the MIS selected for Project-level analysis, a summary of how the required habitat and/or population monitoring is being achieved by the Forest Service follows. A more detailed description is included in the ANF MIS Report (USFS 2008).

TABLE 2. FOREST-SCALE HABITAT AND POPULATION MONITORING FOR SELECTED MIS

SPECIES	METHOD OF HABITAT AND POPULATION MONITORING
Mule Deer	Trends in mule deer populations are monitored in cooperation with the CDFG as part of their ongoing surveys. Information gathered for Deer Assessment Unit (DAU)-7 and Deer Zone D-11 are used to determine trends in deer populations on the ANF.
Mountain Lion	Trends in mountain lion populations are monitored in cooperation with the CDFG. Information gathered by CDFG is used to determine trends in mountain lion populations on the ANF.
Arroyo Toad	Trends in arroyo toad abundance, distribution, and/or habitat conditions are determined by monitoring population abundance and/or habitat condition in selected locations.
Song Sparrow	Summaries of Breeding Bird Survey (BBS) data are used to identify trends for Southern California. Results of

SPECIES	METHOD OF HABITAT AND POPULATION MONITORING
	riparian bird count surveys are also used to identify trends at the Forest level.
California Spotted Owl	Forest Service Region 5 and CDFG monitoring protocols are used to locate, evaluate, and monitor California spotted owl occupied territories and/or suitable habitat condition.

Mule Deer. Consistent with LMP direction dictating MIS monitoring (USFS 2005a, Part 2, page 97), mule deer population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for deer herd management within the State of California (USFS 2005b, Volume 1, pages 124 – 125). The ANF works closely with CDFG to periodically review deer population status on the forest. Population distribution monitoring for mule deer is conducted at a variety of scales: (1) statewide, hunting zone, and herd population monitoring is managed by CDFG using a variety of methods; (2) forest-level presence data are collected through tracking actual sightings of deer and through documenting signs of deer occupancy, including pellet groups (scat), tracks, antlers, tree rubs, and beds.

Mountain Lion. Consistent with LMP direction dictating MIS monitoring (USFS 2005a, Part 2, page 97), mountain lion population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for management of the mountain lion population in California. The ANF works closely with CDFG to periodically review mountain lion population status on the forest.

Arroyo Toad. In the ANF, there are three known active populations encompassing an estimated 4,000 acres of occupied habitat (USFWS 2009). Arroyo toads occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill and Alder Creeks; and on the desert side of the San Gabriel Mountains in Little Rock Creek (USFS 2008). A fourth population has historically been known to occur along Arroyo Seco, but it is believed that this population has since been extirpated (USFWS 2009). While annual surveys are conducted at the three known occupied locations, there are no estimates of what actual population sizes are on the ANF (USFS 2008). Arroyo toad protocol surveys were conducted within appropriate habitat from 2008 – 2010 for the BRRTP, but no arroyo toads were identified within the Project area (POWER 2010a). Furthermore, no new populations besides those mentioned above have been discovered on the ANF (USFS 2008).

Song Sparrow. Riparian bird count surveys were conducted on the ANF from 1988 – 1997. These surveys provided information regarding past trends and baseline information for song sparrow populations that can be used for comparison with future riparian bird count survey results. Riparian bird count surveys on the ANF and the three other Southern California National Forests will continue to provide a means for identifying trends in song sparrow populations. The riparian bird count surveys provide excellent, standardized data to track status and trend (changes) in the distribution of riparian associated species, such as the song sparrow, at biologically meaningful scales. The riparian bird count surveys, which span the four Southern California National Forests, provide meaningful and scientifically sound data that fulfills the requirements for monitoring song sparrow population trends.

California Spotted Owl. Forest Service Region 5 and CDFG protocol surveys are conducted on the ANF to monitor and evaluate California spotted owls and their population growth. While surveys have occurred infrequently over the last 20 years, they occurred annually from 2005 – 2008 (USFS 2008, Table 16). The results of these surveys can be used to guide management where trends are seen over several years. Protocol surveys were conducted from 2008 – 2010 within the BRRTP vicinity, but no California spotted owls were located (POWER 2010b).

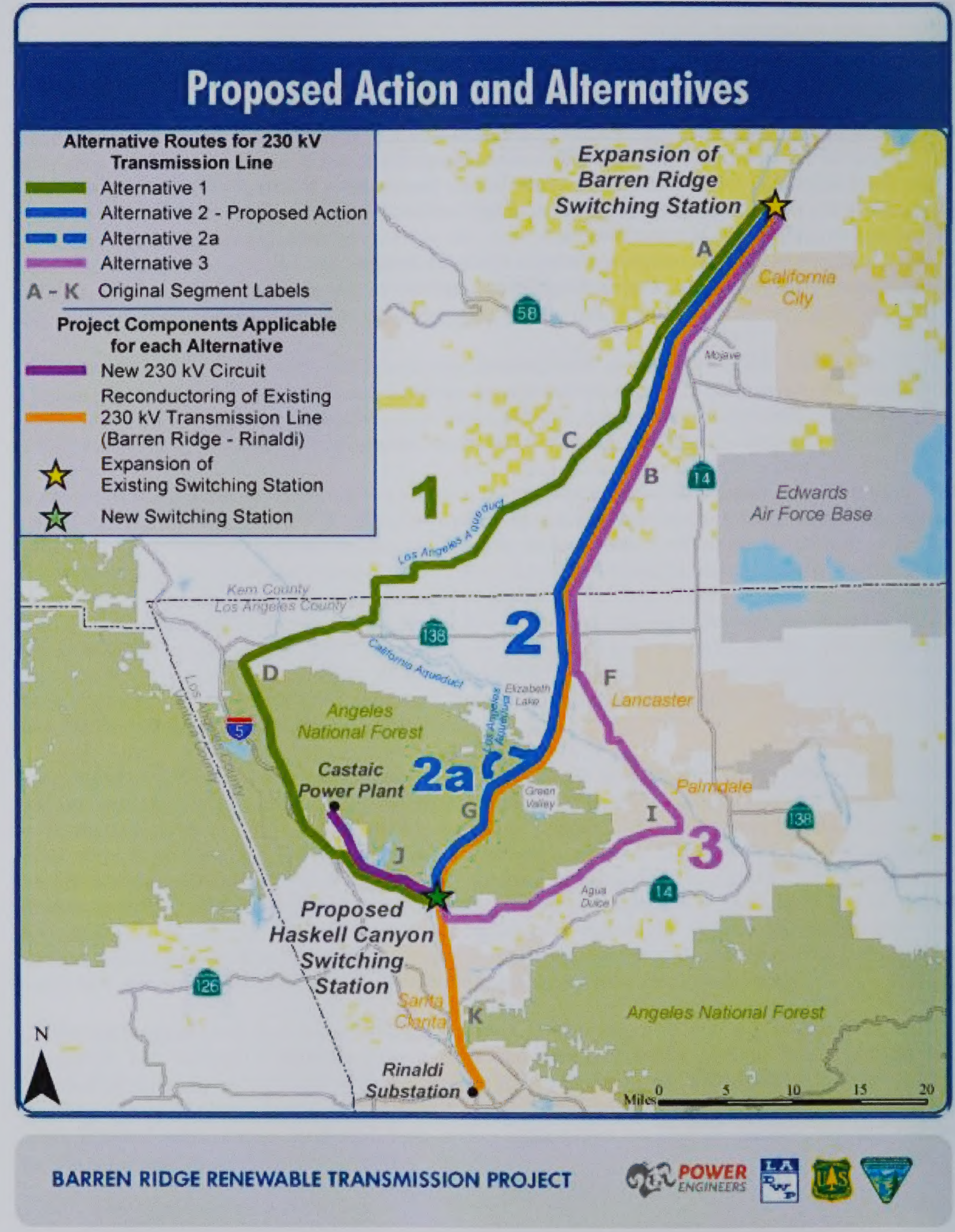
4.0 PROPOSED ACTION

The City of Los Angeles Department of Water and Power (LADWP) is proposing the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access clean, renewable resources in the

Tehachapi Mountain and Mojave Desert areas, and to improve reliability and upgrade transmission capacity. The Project is located in Kern and Los Angeles counties. As shown in Figure 1, the proposed BRRTP would include the following:

1) Construction of approximately 61 miles of a new 230 kilovolt (kV) double-circuit transmission line from the LADWP Barren Ridge Switching Station to Haskell Canyon;
2) Addition of approximately 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant;
3) Reconductoring of approximately 76 miles of the existing Barren Ridge-Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and the Rinaldi Substation;
4) Construction of a new switching station in Haskell Canyon;
5) Expansion of the existing Barren Ridge Switching Station.

FIGURE 1. PROPOSED ACTION AND ALTERNATIVES


Proposed Action and Alternatives
Alternative Routes for 230 kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
A - K Original Segment Labels
Project Components Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
A
B
C
D
F
G
I
J
K
1
2
2a
3
California City
Mojave
58
14
138
5
126
Edwards Air Force Base
Los Angeles Aqueduct
Kern County
Los Angeles County
California Aqueduct
Elizabeth Lake
Angeles National Forest
Castaic Power Plant
Green Valley
Lancaster
Palmdale
Agua Dulce
Los Angeles County
Ventura County
Proposed Haskell Canyon Switching Station
Santa Clarita
Rinaldi Substation
N
Miles 0 5 10 15 20
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
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4.1 PROJECT COMPONENT DESCRIPTIONS

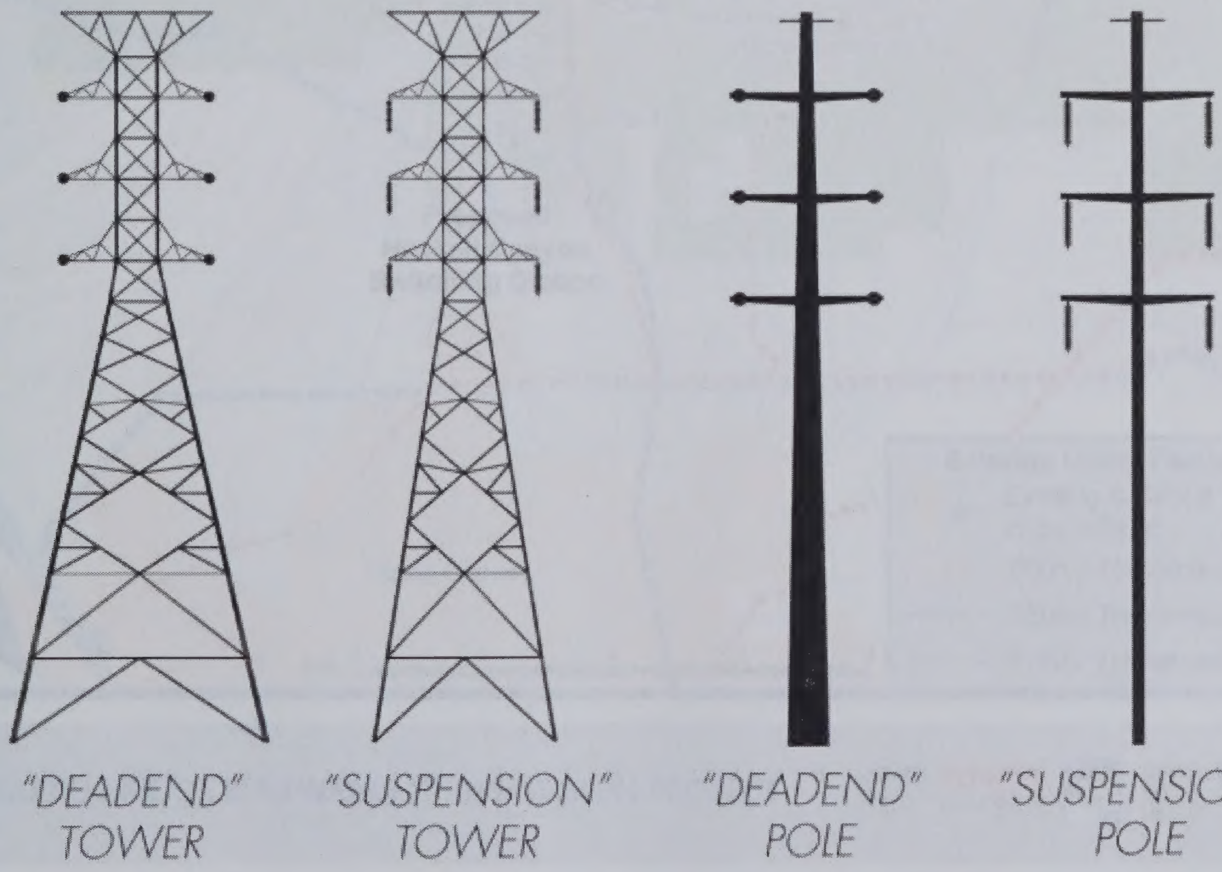
4.1.1 Component 1 - Construction of New 230 kV Double-Circuit Transmission Line

The proposed double-circuit 230 kV transmission line component of the BRRTP would consist of two alternating current (AC) circuits from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station in Haskell Canyon.

The proposed structures for the new transmission line would primarily be self-supporting double-circuit steel lattice towers fabricated from galvanized steel members, as shown on the left side of Figure 2. Depending on the environmental conditions of the surrounding terrain, the height of the proposed lattice structures would range from 110 to 195 feet, with an average tower-to-tower span of 1,000 to 1,100 feet. Appendix F of the Biological Assessment lists the structure specifications for the number of structures per mile, average span length, and average heights for towers and components. Exact structure placement would be determined during engineering surveys and detailed design studies for the selected Alternative route following the Record of Decision (ROD) on the EIS/EIR. A variety of engineering, constructability, existing access, and environmental issues would be considered during detailed structure siting within the permitted right-of-way (ROW).

"Dead-end" towers of self-supporting, steel-lattice design would be required periodically to add longitudinal strength along the line. Dead-end towers would also be used at turn (angle) locations along the line, at heavily loaded tower locations, and at specific utility crossings (e.g., other transmission lines) for added safety. Dead-ended towers are of the same basic configuration as suspension towers (non-angle structures), the difference being in the tower "arms," insulator systems, and tower weights.

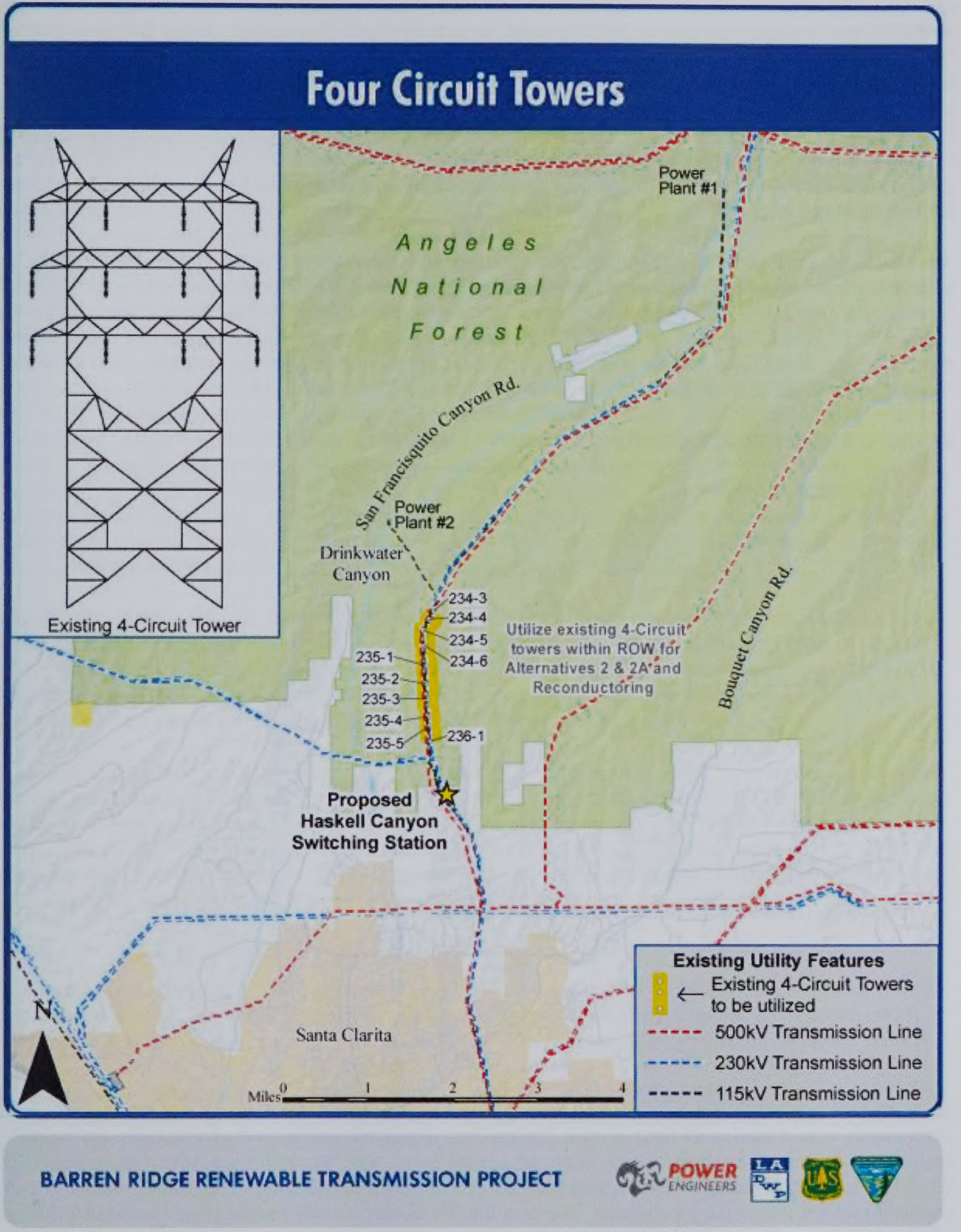
FIGURE 2. TYPES OF TOWERS



Self-supporting, tubular steel poles (TSP) have been proposed by LADWP as an available mitigation structure where appropriate to reduce potential impacts, such as conflicts with cultivation on agricultural lands. The TSPs can reduce impacts in some cases due to a smaller footprint than the proposed self-supporting steel lattice structures; however, more TSPs per mile are necessary due to a shorter average span between structures. The TSPs would have an average height range between 95 and 180 feet, depending on the conditions of the surrounding terrain, with an average tower-to-tower span of 700 to 800 feet. Refer to Figure 2 for an illustration of the double-circuit poles.

For the majority of the alignment, the two new 230 kV circuits would be placed on new double-circuit transmission towers, but for approximately 1.5 miles, the circuits would be placed on existing four-circuit structures that are located just north of the proposed Haskell Canyon Switching Station. Between where the existing BR-RIN crosses Dry Canyon to the intersection of the Castaic transmission lines, LADWP has existing four-circuit towers with three vacant positions. The existing towers would be utilized in this section for the proposed 230 kV double circuit transmission line instead of constructing new towers. See Figure 3 for the location and illustration of the existing four-circuit towers to be utilized.

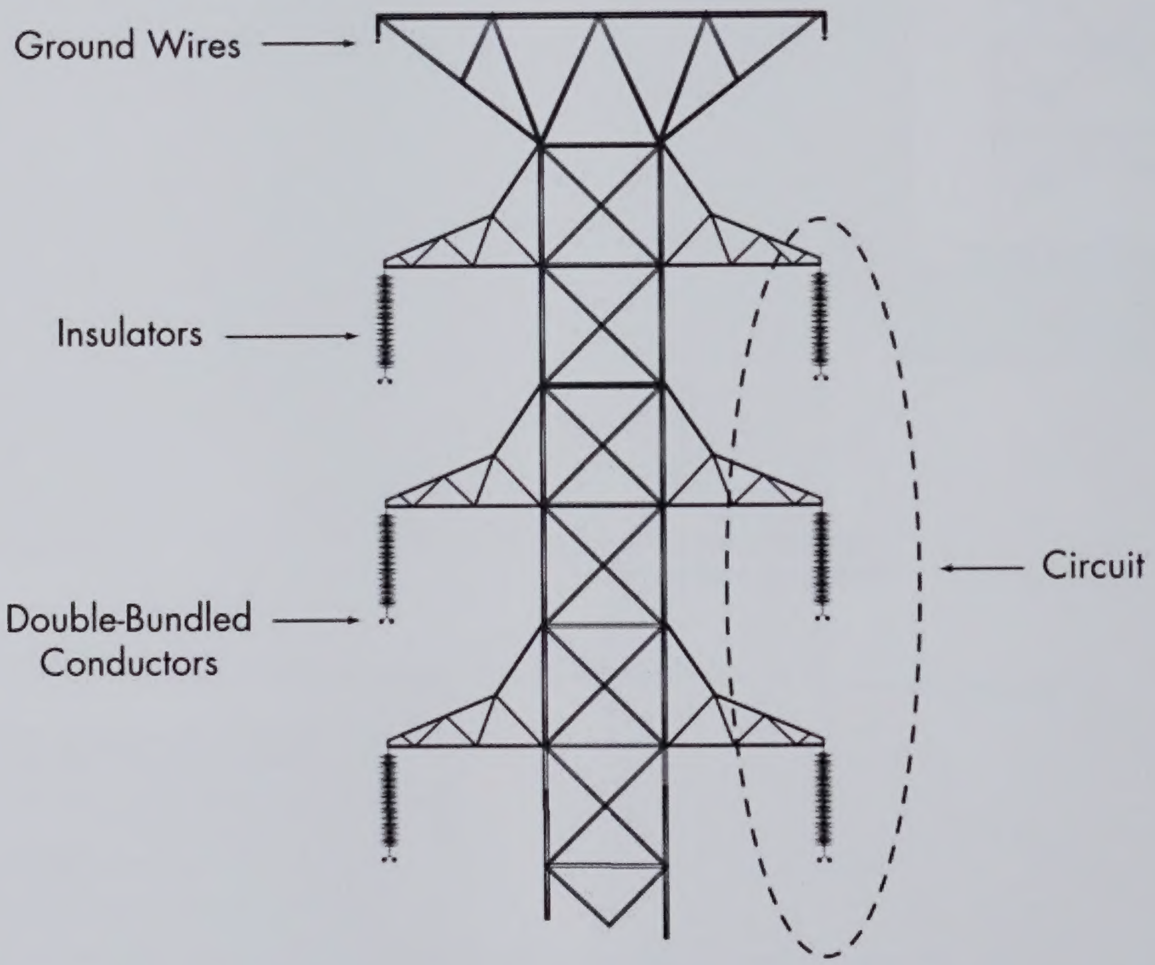
FIGURE 3. FOUR-CIRCUIT TOWERS TO BE UTILIZED


Four Circuit Towers
Existing 4-Circuit Tower
Power Plant #1
Angeles National Forest
San Francisquito Canyon Rd.
Power Plant #2
Drinkwater Canyon
234-3
234-4
234-5
234-6
235-1
235-2
235-3
235-4
235-5
236-1
Utilize existing 4-Circuit towers within ROW for Alternatives 2 & 2A and Reconductoring
Bouquet Canyon Rd.
Proposed Haskell Canyon Switching Station
Santa Clarita
N
Miles 0 1 2 3 4
Existing Utility Features
Existing 4-Circuit Towers to be utilized
500kV Transmission Line
230kV Transmission Line
115kV Transmission Line
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

The self-supporting steel lattice structures and TSPs would utilize concrete foundations. Steel lattice structures would require four footings (one for each leg); TSPs would require single footings. Footings would be steel-reinforced concrete pier type and be cast in place. The typical design for the concrete footings for lattice structures would be between 2.5 and 5.0 feet in diameter, with an average depth of 20 feet depending on soil conditions. Typical design for single foundations for TSPs would include augured holes approximately five to seven feet in diameter and 15 to 30 feet deep, depending on conditions. Formwork steel reinforcing would be assembled in the hole prior to casting concrete in place. Reinforcing steel would become integral to the lower leg of the steel lattice structure during assembly. An above-ground concrete form placed over each hole would result in a final concrete foundation height of 0.5 to 2.0 feet above ground level.

As illustrated in Figure 4, Typical Tower Components, each tower carries conductors ("wires"), insulators, and ground wires. The conductor being considered for the new double-circuit 230 kV transmission line and installation of the Castaic – Haskell Canyon #4 circuit on existing structures is a bundled 715.5 kcmil "Starling" ACSS/AW. The reconductoring of the BR-RIN transmission line between Barren Ridge Switching Station and Rinaldi Substation would require a bundled 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor.

FIGURE 4. TYPICAL TOWER COMPONENTS



Each circuit would consist of three phases ("wires") as illustrated in Figure 4. To increase the current-carrying capability of the transmission lines and reduce power loss, the Proposed Action (Alternative 2) would utilize bundled conductors installed for each phase. The bundled conductors would consist of two conductor cables connected by a spacer. The new 230 kV double-circuit transmission line would consist of a total of six double-bundled (12 individual) wires.

Minimum conductor height above the ground, under normal operation of the line, is 30 feet. Greater clearances may be required in certain areas to allow for clearances over trees or other vegetation that could pose a risk to the operation of the transmission line. Minimum conductor clearance would dictate the exact height of each tower based on topography and safety clearance requirements.

Insulators are used to provide the physical connection of conductors to structures. These system components are made of very low conducting materials (polymer insulators) that inhibit the flow of electric current from energized conductors to ground or to other energized system elements. Insulators and their associated hardware are to be configured in an "I" assembly to support conductors while maintaining required distances between phases and grounded structures. Each "I" string would consist of six-inch diameter insulators between six and eight feet long.

To shield conductors from hazard of direct lightning strikes by transferring lightning currents into the ground, overhead ground wires (shield wires) or fiber optic ground wire would be installed on top of new structures.

Construction of a transmission line involves the following general sequence of events: surveying activities; identifying and constructing access roads; clearing ROW and tower sites (including construction yards and batch plants); installing foundations; assembling and installing the towers; clearing, pulling, tensioning, and splicing; installing ground wires and conductors; installing counterpoise; switching station tie-in; and site upkeep and site reclamation. Various phases of construction would occur at different locations throughout the construction process for the BRRTP. This would require several contractors operating at the same time and in different locations. Refer to Appendix F of the Biological Assessment for a description of each construction activity.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads could be used, that are located in close proximity to the proposed or existing ROW centerlines, only new spur roads to the tower sites would be constructed. The specific locations and design of all new access and spur roads would be determined during final Project design.

It is anticipated that one or two construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located centrally or near each end of the transmission line route. The staging areas would likely be located on previously disturbed land and would be level and surfaced with crushed aggregate base. The LADWP would negotiate with landowners for specific locations of the staging areas.

Three-Circuit Tower Mitigation

In areas where there are ROW expansion constraints and where LADWP has existing 230 kV transmission lines, LADWP is proposing to construct three-circuit towers within the existing ROW to carry the existing BR-RIN circuit and the two proposed Barren Ridge to Haskell Canyon (BR-HC) circuits. This would avoid various impacts, including the acquisition of residential property in the unincorporated communities of Willow Springs (milepost 27.1 to 27.6), Elizabeth Lake, and Green Valley (milepost 44.6 to 51.7). Refer to Figure 5 for an illustration of three-circuit tower types, and to Figure 6, the Three-Circuit Tower Mitigation Map, for proposed locations.

FIGURE 5. THREE-CIRCUIT TOWER TYPES

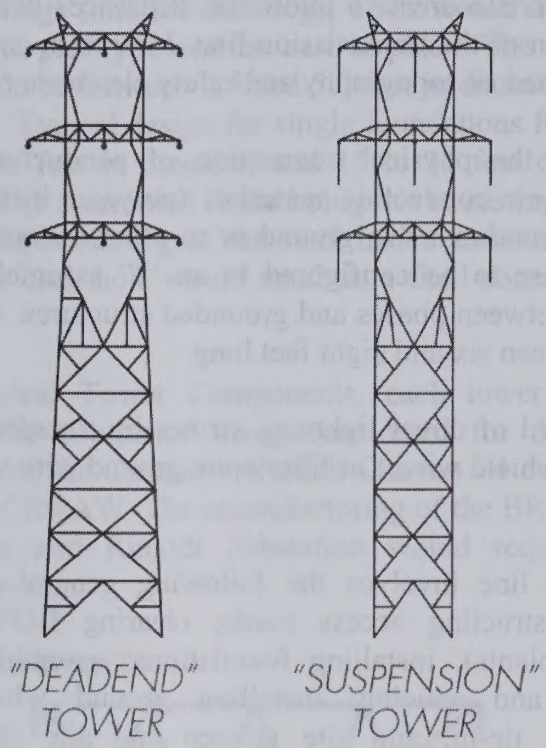
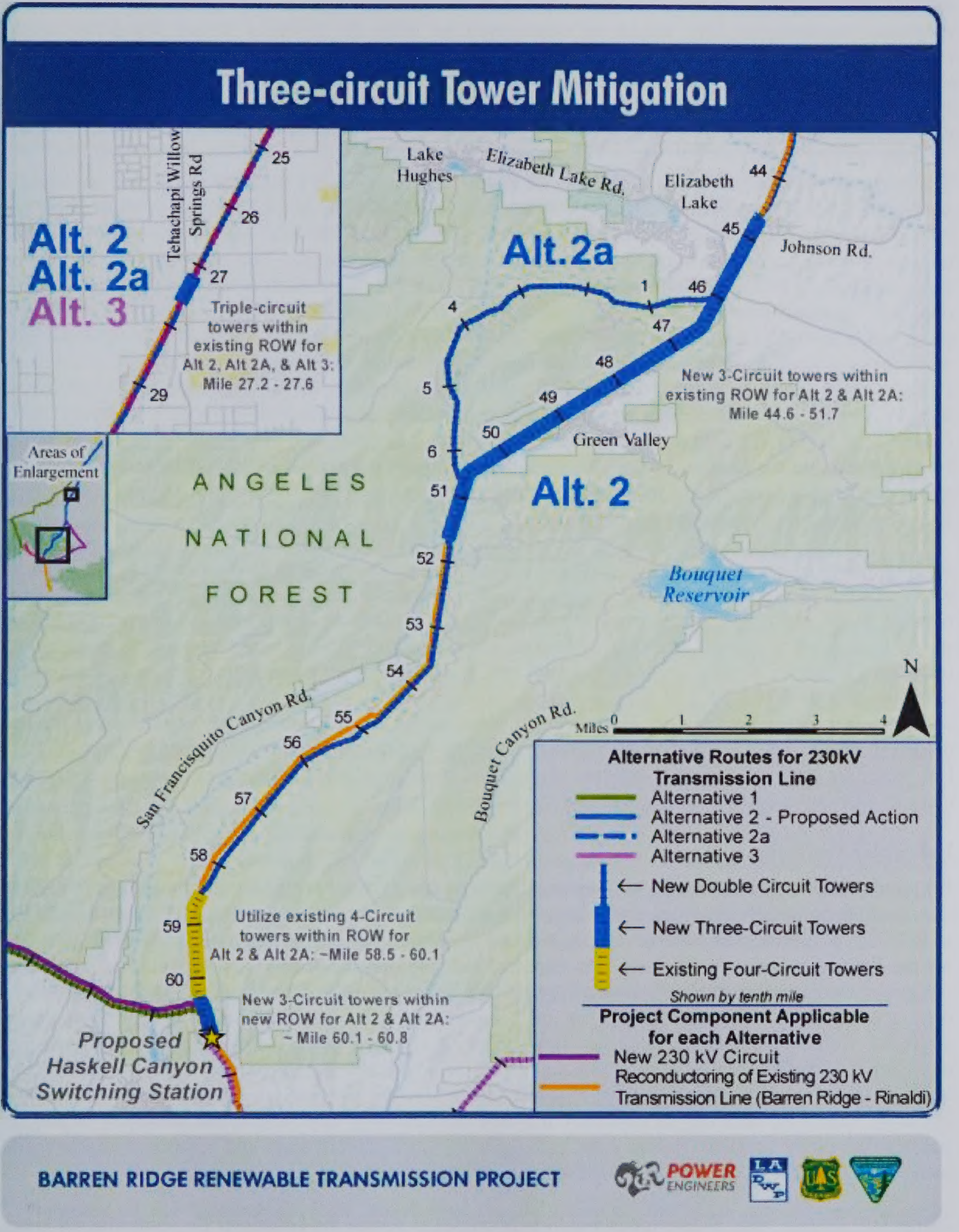

"DEADEND" TOWER
"SUSPENSION" TOWER

FIGURE 6. THREE-CIRCUIT TOWER MITIGATION


Three-circuit Tower Mitigation
Alt. 2
Alt. 2a
Alt. 3
Tehachapi Willow Springs Rd
25
26
27
29
Triple-circuit towers within existing ROW for Alt 2, Alt 2A, & Alt 3: Mile 27.2 - 27.6
Areas of Enlargement
Lake Hughes
Elizabeth Lake Rd.
Elizabeth Lake
Johnson Rd.
44
45
46
1
47
48
49
50
4
5
6
51
52
53
54
55
56
57
58
59
60
Alt.2a
Alt. 2
New 3-Circuit towers within existing ROW for Alt 2 & Alt 2A: Mile 44.6 - 51.7
Green Valley
ANGELES NATIONAL FOREST
Bouquet Reservoir
San Francisquito Canyon Rd.
Bouquet Canyon Rd.
N
Miles 0 1 2 3 4
Utilize existing 4-Circuit towers within ROW for Alt 2 & Alt 2A: ~Mile 58.5 - 60.1
New 3-Circuit towers within new ROW for Alt 2 & Alt 2A: ~ Mile 60.1 - 60.8
Proposed Haskell Canyon Switching Station
Alternative Routes for 230kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
← New Double Circuit Towers
← New Three-Circuit Towers
← Existing Four-Circuit Towers
Shown by tenth mile
Project Component Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
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US

LADWP must maintain the electrical service along the existing BR-RIN transmission line to avoid impacts to the hydroelectric power plants north of the Barren Ridge Switching Station. Therefore, a temporary transmission line would be constructed to keep the BR-RIN circuit energized during construction of the three-circuit towers. After the temporary line is constructed, the existing BR-RIN single-circuit towers would be removed to allow the new three-circuit towers to be constructed within the existing ROW. Once construction of the three-circuit towers is completed, the temporary transmission line would be removed.

The temporary transmission line would be 7.5 miles long and would consist of wood and steel single poles with an average height of 95 feet, a 3-foot by 3-foot footprint, and an average of eight poles per mile. Construction would occur within a new temporary 80- to 100-foot ROW. The majority of the temporary transmission line would be constructed along San Francisquito Road. Portions would also be constructed along Elizabeth Lake Road and Johnson Road. Pole placement would be adjacent to public roadways wherever possible. If necessary, temporary ROW on private property would be needed where poles could not be placed within public road ROW. The majority of poles would be direct-embedded when set in place and would not require a permanent foundation. Where additional strength is necessary at larger angle points, steel poles would be required, which could require an excavation approximately 6 feet in diameter by 20 feet deep to accommodate the concrete pier foundation that would be cast in place. Once all the poles have been constructed and the conductor installed, the existing BR-RIN circuit would be connected into the temporary line and energized. The construction would require establishment of a staging area, work areas around poles, and pull and tension sites. Access to pole sites and pull and tension sites would be from the adjacent roadways.

Approximately seven miles of the existing BR-RIN single-circuit towers would be removed, with existing ROW utilized to access the existing towers. The new three-circuit towers would be placed within the existing ROW, utilizing existing access roads. Helicopter Mitigation, as described in this section below, would be applied in steeper terrain if additional access is required. The new three-circuit tower would require a 25-foot by 30-foot structure footprint and an average of seven structures per mile; the average structure height would be 170 feet, with a maximum tower-to-tower span length of 780 feet. The construction process for the new three-circuit towers would be the same as the double-circuit towers discussed above. After completion of construction of the three-circuit towers, the temporary transmission line would be removed and all temporary staging and work area land disturbances would be restored as close to previous conditions as possible and revegetated as required.

Helicopter Mitigation

Within the ANF where the terrain is steep and access is limited, the Forest Service would require that the new double-circuit 230 kV structures be constructed with the use of helicopters (such as the Hughes 500 or Bell 212, or Sikorsky Skycrane). Although no specific locations for this mitigation have been identified for the Proposed Action, as defined, it is expected that the Forest Service would require the helicopter mitigation for construction in any area more than 300 feet from an existing road and with slopes greater than approximately 25 percent. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. However, the following site and ground disturbing construction activities would be required to construct the new transmission line within the identified helicopter construction areas: portable landing pads, helicopter fly yards/staging areas and associated access roads, tower structure vegetation clearing, guard structures at major crossings, and access road pullouts.

Temporary 24-foot wide access roads would be required to access the helicopter fly yards/staging areas. The transmission line materials (tower steel, conductor reels, structure hardware, etc.) would be delivered by truck to the helicopter fly yards/staging areas. Vegetation clearing may be required at these sites to ensure safe working conditions. The fly yards/staging areas would serve as helicopter support yards for fueling and maintenance, as well as for the transport of materials and personnel. Towers may also be assembled in sections at these yards prior to delivery to the tower sites. Heavy lift helicopters would then fly the towers from the yards to the tower sites.

Portable landing pads would be located at each tower site. These pads would allow helicopters to load and unload personnel, tools, and equipment necessary for construction of foundations and assembly of tower structures. Helicopter-constructed towers that would not be in close proximity to existing access roads would utilize micropile foundations. For each tower leg, micropile foundations would use a group of three to eight 6- to 9-inch diameter casings that would be drilled and grouted into the ground. The exposed portion of the pile group would be encased in a reinforced concrete cap from the top of the casings to a depth anywhere from one to eight feet below the ground surface, depending on the terrain.

Conductor installation would proceed in the same manner as the double-circuit tower installation. The equipment necessary for conductor installation would be large, heavy construction equipment that could only be brought in by truck. Some NFS roads could need maintenance or improvement to allow pulling and tensioning, but no new access or spur roads would be created for conductor installation on the helicopter-constructed towers. After project completion, any maintained access roads to helicopter fly yards/staging areas to would be reduced to 16 feet.

4.1.2 Component 2 - Addition of New 230 kV Circuit

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV Transmission Line structures. The circuit would cross the unincorporated communities of Castaic and Saugus and the city of Santa Clarita. A total of 300 feet of U.S. Department of the Interior, Bureau of Land Management (BLM)-managed public lands and four miles of NFS lands would be traversed; however, the new circuit would not require a new or additional ROW. This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (bundled 715.5 kcmil "Starling" ACSS/AW [aluminum conductor steel supported/aluminum-clad steel wire]) as that proposed for the new 230 kV transmission line between Barren Ridge and Haskell Canyon Switching Stations.

The addition of a new circuit on existing towers would require many of the same construction activities associated with a new transmission line (refer to Appendix F of the Biological Assessment for a description of each construction activity). However, all work would be within existing ROW and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor. Specific towers requiring reinforcement would be determined following detailed design of the Project. Tower reinforcement would not alter the general design or the location of the structures. This process would generally include reinforced foundations or steel member replacements. Refer to Figure 1 for a map showing the location of the new 230 kV circuit.

4.1.3 Component 3 - Reconductoring of Existing Transmission Line

LADWP proposes the reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station to Rinaldi Substation. Four miles of BLM-managed public lands, 13 miles of National Forest System (NFS) lands, and 44 miles of private property would be traversed. The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS (aluminum conductor steel supported/trapezoidal wires/high strength) conductor. The new conductor would have a larger diameter that allows for greater electrical capacity.

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of right-of-way [ROW], rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, and cleanup). Removal of the existing conductor would be used to string a pulling line, and this line would then be used to pull in the new conductor. All work would remain within the existing 250-foot-wide ROW, with no additional ROW required. Some of the towers would need to be modified, replaced, and/or have foundations reinforced or replaced to carry the additional weight of the new heavier conductor. Refer to Figure 1 for the location of the reconductoring.

4.1.4 Component 4 - Construction of New Switching Station

As a component of the BRRTP, LADWP proposes the construction of a new switching station in Haskell Canyon, south of the Angeles National Forest on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines (the existing BR-RIN, the proposed double-circuit Barren Ridge – Haskell Canyon, existing Castaic – Northridge, Castaic – Sylmar, Castaic – Olive, and the proposed Castaic – Haskell Canyon). Refer to Figure 1 for the location of the new switching station.

The station would be approximately 500 feet by 600 feet to accommodate the necessary circuit positions, which are made up of equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide and would be enclosed by chain-link fencing with barbed-wire extension for security. The preliminary grading plan for the station is located in Appendix F of the Biological Assessment.

Necessary pre-construction geotechnical investigation on-site would include six borings by a drill rig to investigate bedrock and soil stability and four cone penetration test locations after site grading to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks, and mechanic trucks would also be required. Construction would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut and fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. A 16-foot-wide paved road and a 100-foot by 100-foot gravel parking area would be required. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 120-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Multiple transmission lines would be terminated into the switching station (i.e., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would need support and

require the installation of galvanized steel structures. An existing 115 kV transmission line may need to be relocated around the proposed station. High-voltage bus work consisting of aluminum jumpers and tubing would be installed within the station.

4.1.5 Component 5 - Expansion of Existing Switching Station

LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet by 500 feet, for a total station size of 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and a drainage area. The preliminary design layout for the station may be found in Appendix F of the Biological Assessment. Refer to Figure 1 for the location of the existing switching station.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station as described above. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Necessary pre-construction geotechnical on-site investigation would include two test pits excavated by a backhoe to investigate soil density and settlement, and four cone penetration test locations on-site to determine friction resistance for piers. The cone penetration test rig would be a small truck with a hydraulic ram assembly mounted on the back, which is used to push a 2.5-inch diameter cone into the ground to a depth up to 50 feet. Existing roads would be used to access the site.

It is estimated that 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over a 90-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, water trucks, scrapers, sheep's foot compactors, front end loaders, concrete trucks, trucks, and flatbed trailers. Cranes, man-lifts, portable-welding units, line trucks, and mechanic trucks would also be required. An estimated eight months with approximately 60 workers would be required to expand the station.

4.1.6 Project-Wide Mitigation Measures

To address potential impacts of the Proposed Project to multiple resource areas as discussed above, the following project-wide mitigation measure would be applied:

> Three-Circuit Tower Mitigation (THREE-CIRCUIT) – A three-circuit lattice tower design would be implemented as described in Section 4.1.1 of this report, at the locations shown in Figure 6, Three-Circuit Tower Mitigation Map.
>
> Helicopter Mitigation (HELICOPTER) – Helicopter Mitigation shall be implemented, as described in Section 4.1.1 of this report, in steep areas of the ANF where access is limited. For Alternatives 1 and 2a, implementation would occur at the locations shown on Figure 9, Identified Helicopter Mitigation Map. During final design of the Project, areas other than those shown on Figure 9, including Alternatives 2 and 3, may potentially require helicopter construction of the towers. This determination would generally be made where tower sites have no existing access roads within 300 feet and slopes are greater than 25 percent. Final identification of these tower sites would be determined and agreed upon by the Forest Service, BLM and LADWP.

4.1.7 Construction Monitoring

An approved compliance program would be developed to address mitigation requirements associated with the avoidance of sensitive plant and animal species, cultural sites, or other sensitive features located

within or adjacent to the Project. Resource protection measures proposed by LADWP for this Project are described in Section 4.4. These measures will be included in the POD.

TABLE 3. ESTIMATED TEMPORARY DISTURBANCE OF VEGETATION COMMUNITIES WITHIN THE BRRTP

Vegetation Community	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Alternative 1						
Chamise Chaparral	488.38	50.87	56.06	9.98	16.73	3.43%
Riversidian Sage Scrub	100.74	9.74	10.48	1.84	3.06	3.04%
Southern Coast Live Oak Riparian Forest	3.59	0.38	0.38	0.05	0.05	1.35%
Southern Cottonwood Willow Riparian Forest	8.04	0.86	0.86	0.23	0.42	5.28%
Southern Mixed Chaparral	349.92	40.80	45.81	8.36	14.13	4.04%
Southern Sycamore Alder Riparian Woodland	2.38	0.25	0.25	0.07	0.13	5.28%
Southern Willow Scrub	12.91	1.11	1.30	0.19	0.32	2.48%
Alternative 2 – LADWP's Proposed Action and Federal Agency Preferred Alternative						
Chamise Chaparral	344.45	38.61	39.38	6.9	10.11	2.9%
Barren/developed	231.75	24.86	24.86	4.84	7.80	3.4%
Riversidian Sage Scrub	82.47	8.85	8.85	1.37	1.84	2.2%
Southern Coast Live Oak Riparian Forest	20.33	3.01	3.40	0.56	0.69	3.4%
Southern Mixed Chaparral	81.79	8.77	8.77	1.89	3.24	4.0%
Southern Riparian Scrub	6.19	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	20.32	2.18	2.18	0.50	0.50	2.5%
Alternative 2a						
Canyon Live Oak Forest*	-	-	-	-	-	-
Chamise Chaparral	344.44	38.61	39.38	6.90	10.11	2.94%
Barren/developed	119.26	12.45	12.72	2.15	3.24	2.72%
Interior Live Oak Chaparral	53.92	5.18	5.60	1.14	2.06	3.83%
Riversidian Sage Scrub	82.47	8.85	8.85	1.37	1.84	2.23%
Scrub Oak Chaparral	30.05	3.12	3.19	0.78	1.46	4.85%
Southern Coast Live Oak Riparian Forest	20.33	3.01	3.40	0.56	0.69	3.39%
Southern Mixed Chaparral	268.16	25.39	27.88	5.17	9.03	3.37%
Southern Riparian Scrub	6.19	0.66	0.66	0.17	0.33	5.28%
Southern Sycamore Alder Riparian Woodland	15.32	1.64	1.64	0.43	0.81	5.27%
Alternative 3						
Barren/developed	19.45	2.12	2.13	0.56	1.04	5.35%
Riversidian Sage Scrub	140.94	24.72	28.19	5.81	9.57	6.79%
Scrub Oak Chaparral	54.36	5.83	5.83	1.52	2.87	5.28%
Southern Riparian Scrub	6.47	0.69	0.69	0.18	0.34	5.28%
Reconductoring						
Chamise Chaparral	304.26	32.65	32.65	8.54	16.07	5.3%
Barren/developed	235.69	25.28	25.28	4.86	7.77	3.3%
Riversidian Sage Scrub	85.68	10.30	10.30	2.69	5.07	5.9%
Southern Coast Live Oak Riparian Forest	61.53	6.60	6.60	1.73	3.25	5.3%

Vegetation Community	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Southern Mixed Chaparral	74.74	8.01	8.01	1.69	2.87	3.8%
Southern Riparian Scrub	6.17	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	19.61	2.34	2.34	0.54	0.95	4.8%
New 230 kV Circuit						
Chamise Chaparral	139.37	21.06	23.05	4.73	8.03	5.8%
Riversidian Sage Scrub	55.49	5.96	5.96	1.20	1.98	3.6%
Southern Coast Live Oak Riparian Forest	6.11	0.66	0.66	0.08	0.08	1.3%
Southern Cottonwood Willow Riparian Forest	7.49	0.80	0.80	0.21	0.40	5.3%
Southern Sycamore Alder Riparian Woodland	1.78	0.19	0.19	0.05	0.09	5.1%

*Note: Although Canyon Live Oak Forest was identified as a vegetation community present on Alternative 2a during 2010 BRRTP botanical surveys, it is not one of the communities listed in the Gap Analysis Program (GAP) data for this area (POWER 2010c). Because vegetation community mapping was not conducted during the botanical surveys, the exact area and corresponding impact acreages for Canyon Live Oak Forest were not calculated. Acreage numbers for other habitat types listed on Alternative 2a thus may be smaller than those listed in the table above, which is based only on GAP data. This will not change the total acreage of Alternative 2a or any references to habitat for mule deer and mountain lion, which are habitat generalists that occur in all habitat types within the Project area (USFS 2005b, Volume 2, page 77). However, references to suitable habitat acreages for California spotted owl, which is a more specialized species that could occur in Canyon Live Oak Forest, will refer to total suitable habitat on Alternative 2a as being all suitable habitat in the GAP data above excluding Canyon Live Oak Forest.

4.2 OPERATION AND MAINTENANCE ACTIVITIES

Regular inspection and maintenance of overhead facilities is crucial for maintaining uniform, adequate, safe and reliable service. For detailed operation and maintenance activities, please see Appendix F of the Biological Assessment.

4.3 LAND MANAGEMENT PLAN STANDARDS

The following Standards are taken from Part 3 of the LMP and are applicable to impacts to plants and wildlife as described below for the BRRTP (USFS 2005a, Part 3, pages 3 – 13).

- **S6:** Seed to be used on National Forest System lands will be certified to be free of noxious weeds. Where available, only locally collected native seed will be used, or seeds will be used from species that are noninvasive and nonpersistent. When available, wattles, mulch and livestock feed to be used on National Forest System lands will be certified to be free of noxious weeds.
- **S7:** There are extensive areas within and adjacent to the national forests of Southern California meeting the definition of Wildland/Urban Interface (WUI) as described in the Healthy Forests Restoration Act of 2003. WUI (as defined by the Act) is a variable width up to 1.5 miles from communities at risk or as defined in individual community fire protection plans. This forest plan further identifies a direct protection buffer (WUI Defense Zone) and an indirect protection buffer (WUI Threat Zone) that fall within the broader definition WUI. A WUI Defense Zone is the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. The WUI Threat Zone is an additional strip of vegetation modified to reduce flame heights and radiant heat. The Threat Zone generally extends approximately 1.25 miles out from the Defense Zone boundary. Yet, actual extents of Threat Zones are based on fire history, local fuel conditions, weather, topography, existing and proposed fuel treatments, and natural barriers to fire and community protection plans, and therefore could

extend well beyond the 1.25 mile. The two zones together are designed to make most structures more defendable.

- **S8:** Community protection needs within the WUI Defense Zone take precedence over the requirements of other forest plan direction, including other standards identified in Part 3 of the forest plan. If expansion beyond the 300-foot minimum width of the defense zone is needed due to site-specific conditions, projects will be designed to mitigate effects to other resources to the extent possible.
- **S11:** When occupied or suitable habitat for a threatened, endangered, proposed, candidate or sensitive (TEPCS) species is present on an ongoing or proposed project site, consider species guidance documents (see [LMP Part 3] Appendix H [pages 71 – 75]) to develop project-specific or activity-specific design criteria. This guidance is intended to provide a range of possible conservation measures that may be selectively applied during site-specific planning to avoid, minimize or mitigate negative long-term effects on threatened, endangered, proposed, candidate or sensitive species and habitat. Involve appropriate resource specialists in the identification of relevant design criteria. Include review of species guidance documents in fire suppression or other emergency actions when and to the extent practicable.
- **S12:** When implementing new projects in areas that provide for threatened, endangered, proposed, and candidate species, use design criteria and conservation practices (see [LMP Part 3] Appendix H [pages 71 – 75]) so that discretionary uses and facilities promote the conservation and recovery of these species and their habitats. Accept short-term impacts where long-term effects would provide a net benefit for the species and its habitat where needed to achieve multiple-use objectives.
- **S13:** Manage Critical Biological land use zones so that activities and discretionary uses are either neutral or beneficial for the species and habitats for which the area was established. Accept short-term adverse impacts to threatened, endangered, and proposed species if such impacts will be compensated by the accrual of long-term benefits to habitat for threatened, endangered, and candidate species.
- **S15:** Within riparian conservation areas retain snags and downed logs unless they are identified as a threat to life, property, or sustainability of the riparian conservation area.
- **S17:** In areas outside of Wildland/Urban Interface Defense Zones and fuelbreaks, retain soft snags and acorn storage trees unless they are a safety hazard, fire threat, or impediment operability.
- **S18:** Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging.
- **S19:** Protect all spotted owl territories identified in the Statewide California Department of Fish and Game database (numbered owl sites) and new sites that meet the state criteria by maintaining or enhancing habitat conditions over the long-term to the greatest extent practicable while protecting life and property. Use management guidelines in the species conservation strategy (or subsequent species guidance document; see [LMP Part 3] Appendix H [pages 71 – 75]) to further evaluate protection needs for projects, uses and activities.
- **S20**: Maintain a limited operating period (LOP) prohibiting activities within approximately .25 miles of a California spotted owl nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15), unless surveys confirm that the owls are not nesting. Follow the USDA Forest Service (1993, 1994 or subsequent) protocol to determine whether owls are nesting. The LOP does not apply to existing road and trail use and maintenance, use of existing developed recreation sites, or existing special-uses, such as recreation residence tracts. When evaluating the need to implement a limited operating period, site- and project-specific factors need to be considered (use species management strategy or subsequent guidance; see [LMP Part 3] Appendix H [pages 71 – 75]).

- **S21:** California spotted owl habitat that is lost to development for a compelling reason should be mitigated up to a two-to-one basis considering quality of habitat lost, number of territories affected, reproductive history of pair(s) displaced, location, and related factors. Development includes ski area creation or expansion, new roads or trails, special-use sites and corridors, new recreation or administrative facilities, land exchanges, etc. Mitigation land should be sought first within the mountain range where the impacts occur; if this is not possible, mitigation land should be acquired within the San Gabriel or San Bernardino Mountains.
- **S22:** Except where it may adversely affect threatened and endangered species, linear structures such as fences, major highways, utility corridors, bridge upgrades or replacements, and canals will be designed and built to allow for fish and wildlife movement.
- **S24:** Mitigate impacts of on-going uses and management activities on threatened, endangered, proposed, and candidate species.
- **S25:** Conduct road and trail maintenance activities during the season of year that would have the least impact on threatened, endangered, and proposed wildlife species in occupied habitats, except as provided by site-specific consultation.
- **S27:** Use seasonal closures as specified by site-specific analysis to protect occupied bald eagle wintering, breeding, or nesting habitat.
- **S28:** Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites and within 0.5 miles of active roosts. Refer to California condor species account (or subsequent species guidance document; see [LMP Part 3] Appendix H [pages 71 – 75]) for additional guidance.
- **S31:** Design new facilities or expansion of existing facilities to direct public use away from occupied habitat for threatened, endangered, proposed and candidate species.
- **S32:** When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist.
- **S33:** Manage Special Interest Areas so that activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established. Accept short-term adverse impacts to these resource values if such impacts will be compensated by the accrual of long-term benefit.
- **S37:** Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles. Mitigate impacts where such use does occur.
- **S42:** Include provisions for raptor safety when issuing permits for new power lines and communication sites (see guidelines in [LMP Part 3] Appendix G). Also implement these guidelines for existing permits within one year in identified high-use flyways of the California condor, and within five years in other high-use raptor flyways. Coordinate with California Department of Fish and Game, U.S. Fish & Wildlife Service, and power agencies to identify the high-use flyways.
- **S47:** When designing new projects in riparian areas, apply the Five-Step Project Screening Process for Riparian Conservation Areas as described in [LMP Part 3] Appendix E - Five-Step Project Screening Process for Riparian Conservation Areas.
- **S49:** Require fish passage instream flows associated with dams and impoundments where fish passage will enhance or restore native or selected nonnative fish distribution and not cause adverse effects to other native species.

4.4 GENERAL PRACTICES AND MITIGATION MEASURES

The following tables describe proposed General Practices (GPs) and mitigation measures to reduce the impact of effects that may be generated by construction of the BRRTP. These were written in collaboration with ANF staff and apply to preconstruction, construction, and post-construction aspects of the Project. The GPs were written for all resources of the Project. Because not all of these are applicable to biology, ones that do not apply to biology have been removed and show "*not applicable*" in the table below. The entire list can be viewed in the BRRTP Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) (USFS, BLM, and LADWP 2011).

The mitigation measures are specific to biology and are in response to various impacts that could occur to vegetation, wildlife, and/or habitat. Impacts BIO-9 (The Project could potentially affect wildlife movement corridors and disturb wildlife movement), BIO-10 (The proposed Project may result in edge-associated impacts), and BIO-12 (Indirect impacts to wildlife species) do not have respective mitigation measures.

TABLE 4. GENERAL PRACTICES

GP #	DESCRIPTION
	PLANS
GP-1	**Plan of Development & Construction, Operation and Maintenance Plans.** In consultation with the Forest Service and BLM Authorizing Officers prior to construction, LADWP shall develop a COM Plan with the Forest Service and POD with BLM. These plans shall be attached to and become a part of the Special Use and Right-of-Way Authorizations. The COM Plan and POD shall include, at a minimum, road maintenance specifications, vegetation treatment and rehabilitation specifications, and conditions on maintenance and replacement of improvements. The agencies may combine the POD and COM plans into a single document for the Project.
GP-2	*Not applicable*
GP-3	*Not applicable*
GP-4	*Not applicable*
GP-5	*Not applicable*
GP-6	*Not applicable*
GP-7	**Soil Management Plan.** A Soil Management Plan will be developed and implemented for construction of the proposed Project. The objective of the Soil Management Plan is to provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities. The plan will include practices that are consistent with California Title 8, Occupational Safety and Health Administration (Cal-OSHA) regulations, as well as appropriate remediation standards that are protective of the planned use. The Plan will provide guidelines for identification of impacted soil, assessing impacted soil, soil excavation, impacted soil storage, verification sampling, and impacted soil characterization and disposal. In the event that potentially contaminated soils are encountered within the footprint of construction, soils will be tested and stockpiled. The appropriate Certified Unified Program Agency (CUPA) will determine whether further assessment is warranted.
GP-8	**Avian Protection Plan.** An Avian Protection Plan (APP) shall be developed and implemented for the construction and operation of the Project. The APP will outline measures and protocols that will be undertaken to protect avian species and is intended to protect local and migratory bird species that may occur within the Project area.
	DESIGN
GP-9	*Not applicable*
GP-10	*Not applicable*
GP-11	Structures will be placed so as to avoid sensitive features including, but not limited to, riparian areas, water courses, and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower design. This will minimize the amount of sensitive features disturbed and/or reduce visual contrast.
GP-12	Drainage control features will be installed, as appropriate, to minimize the amount of stormwater flow from areas of active construction. Details would be described in the SWPPP.
	CONSTRUCTION VEHICLES/EQUIPMENT
GP-13	*Not applicable*
GP-14	*Not applicable*
GP-15	*Not applicable*
GP-16	*Not applicable*
GP-17	*Not applicable*
GP-18	*Not applicable*
GP-19	*Not applicable*
GP-20	*Not applicable*

GP #	DESCRIPTION
GP-21	*Not applicable*
GP-22	The Applicant shall clear brush and dead and decaying vegetation that would pose a fire hazard from the work area prior to starting construction and/or maintenance work. The work area includes the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. Cleared vegetation shall either be removed or chipped and spread onsite in piles no higher than six inches.
	ACCESS ROADS
GP-23	*Not applicable*
GP-24	*Not applicable*
GP-25	*Not applicable*
GP-26	*Not applicable*
GP-27	*Not applicable*
GP-28	*Not applicable*
GP-29	*Not applicable*
GP-30	*Not applicable*
GP-31	*Not applicable*
GP-32	*Not applicable*
GP-33	*Not applicable*
	CONSTRUCTION AREAS
GP-34	Construction activities shall be limited to the designated ROW and approved access and work areas as identified in the ROD and POD. Any deviations from the approved areas must be cleared with the jurisdictional agency and/or landowner.
GP-35	*Not applicable*
GP-36	*Not applicable*
GP-37	*Not applicable*
GP-38	*Not applicable*
GP-39	*Not applicable*
GP-40	*Not applicable*
GP-41	Allow natural vegetation to reoccur on temporarily disturbed areas following the completion of construction.
GP-42	Weed control measures on non-federal lands shall be implemented as determined in consultation with CDFG, the Forest Service, and the Counties of Los Angeles and Kern Agricultural Commissions.
GP-43	Every effort will be made to minimize vegetation removal and permanent loss at construction sites. Native vegetation will be flagged for protection or stockpiled for recontouring use at the discretion of the Biological Monitor and the Construction Supervisor.
GP-44	In construction areas where recontouring is not required, vegetation will be left in place wherever possible and the original contour will be maintained to avoid excessive root damage and allow for resprouting. Disturbance will be limited to overland driving where feasible to minimize changes in the original contours.
GP-45	Use of heavy equipment within a flowing channel will be avoided if possible; however, should it be necessary for heavy equipment to be used within a flowing channel, the Environmental Monitor will be notified prior to initiation of construction activities to allow adequate time for site visits and surveys, if necessary.
GP-46	Asphalt or cement equipment will not be rinsed in, nor excess products deposited into, any stream or other waterway. Asphalt or concrete effluent will not be allowed to enter into streams or RCAs. Effluent will be removed from standing water and prevented from entering a waterway.
GP-47	Fill material, including brush, loose soils, and other similar debris, will not be deposited within a stream channel or on a stream bank.
	SURVEYS/MONITORING
GP-48	**Biological Monitor.** For areas identified as environmentally sensitive, such as streams, wetlands, riparian areas, and other environmentally sensitive areas, a biological monitor shall be present during ground disturbing construction activities. The qualified biologist shall conduct monitoring for any area subject to disturbance from construction activities that may impact biological resources. The biological monitor's duties include minimizing impacts to special-status species, native vegetation, wildlife habitat, and unique resources, as well as to identify potential issues or impacts to biological resources and report those to the authorized biologist. Where appropriate, the monitor will flag the boundaries of biologically sensitive areas and monitor any construction activities in these areas to ensure that ground disturbance activities and impacts occur within designated limits.

GP #	DESCRIPTION
GP-49	**Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) will be implemented to educate all construction personnel of the area's environmental conditions and the environmental protection measures that must be adhered to. An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, protection of biological and cultural resources, and proper Best Management Practice (BMP) implementation, to all construction and maintenance personnel.
	COORDINATION/PERMITS
GP-50	*Not applicable*
GP-51	*Not applicable*
GP-52	*Not applicable*
GP-53	Incorporate riparian area avoidance and permit measures. The following actions and all permit conditions detailed within the individual or Nationwide 404 permit and Regional Water Quality Control Board (RWQCB) 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). Before construction, qualified resource specialists would stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones would include a ten-foot buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities would be restricted from these zones, although essential vehicle operation and foot travel would be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities would be prohibited within the exclusion zone. In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector, would narrow the width of the centerline to the maximum extent allowable. New spur roads and existing access road improvements would be constructed and implemented using methodology that preserves existing hydrology. Tower pad clearance would be minimized to the maximum extent allowable. All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities would be restored to ensure no net loss of habitat functions and values. Following construction activities, the areas would be restored as soon as practicable.
GP-54	Construction crews will avoid impacting the streambeds and banks of any streams along the route to the extent feasible. When construction or maintenance work affects the bed, bank or margins of a stream under CDFG jurisdiction, LADWP will notify CDFG as required under Fish and Game Code Section 1602, which may include securing a Streambed Alteration Agreement.
GP-55	*Not applicable*
GP-56	LADWP would obtain appropriate Tree Removal Permits when necessary from the appropriate government agencies. In accordance with the obtained permits, LADWP shall avoid or minimize impacts to protected trees.
GP-57	*Not applicable*
GP-58	*Not applicable*
GP-59	*Not applicable*
	NOISE
GP-60	*Not applicable*
GP-61	*Not applicable*
GP-62	*Not applicable*

TABLE 5. PROPOSED BRRTP MITIGATION MEASURES

Mitigation Measure	Description
BIO-1	*Provide restoration/compensation for impacted sensitive vegetation communities.* **1a** The intent of this mitigation measure is to require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF) Land Management Plan (LMP). Before construction LADWP shall have a qualified biologist, where concurrence on the biologist has been provided by the USFS and approval on the biologist has been provided by the BLM, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees will be documented by identifying the species, number, location, and diameter at breast height (DBH). On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. 1) For NFS and BLM lands, the USFS and BLM shall review and approve a Habitat Restoration and Revegetation Plan, prepared by LADWP in coordination with the federal agencies, for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-federal lands, LADWP shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for topsoil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bare-root or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program;(j) locations and impacts to all oaks and native trees (over 3 inches DBH); (k) locations of temporary or permanent gates, barricades, law enforcement patrolling, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (NFS and BLM lands only). Restoration efforts will not adversely affect listed species or critical habitat and measures will be implemented to protect these species during restoration. 2) LADWP shall utilize a USFS/BLM approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All areas dominated by non-native species before Project disturbance shall be revegetated using appropriate native species. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc. will be accepted without the approval of the USFS and BLM on NFS/BLM lands, and seeds must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-Project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring reporting will be yearly from years one to five and every other year from years six to ten or until the success criteria are met. LADWP shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the ANF LMP. If the survival and cover requirements have not been met, LADWP is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned. 3) On NFS land, the USFS/LADWP will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees (over 3 inches DBH) in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location, and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes, shall not occur until the trees are evaluated by a USFS botanist or authorized arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or adding spoil around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be replaced at the rate appropriate to the DBH. 4) The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native

Mitigation Measure	Description
	trees or any oaks that are to be removed on the ANF shall be as follows: trees from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following California Department of Fish and Game (CDFG) guidelines. On the ANF, any oak or native tree that must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated (off-site) at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by an authorized arborist and USFS botanist. On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.
	5) Permanent impacts on federal lands shall be determined by the appropriate federal manager (USFS and BLM) at the ratios stated below (Table BIO-MM-1) or at a comparable value. On NFS and BLM lands, impacts will be considered permanent if the trees are not likely to recover by ten years post-disturbance. Where on-site restoration is planned for mitigation of temporary impacts to vegetation communities, LADWP shall identify a Habitat Restoration Specialist, where concurrence has been provided by the USFS, to implement the method of restoration outlined by the USFS/BLM in the Habitat Restoration Plan.
	6) On USFS/BLM lands, the creation or restoration of habitat shall be monitored after mitigation site construction to assess progress and identify potential problems with the restoration site. This will be monitored on USFS/BLM lands until the success criteria outlined in the restoration plan are met annually for years one to five, and bi-annually for years six to ten. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken until the success criteria are met as specified above, to ensure the success of the restoration effort. If the mitigation fails to meet the established success criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the USFS/BLM (as appropriate). If a fire occurs in a revegetation area before the success criteria are met, LADWP shall be responsible for a one-time replacement of vegetation. If a second fire occurs, no replanting is required, unless the fire is caused by LADWP activity. Off-site mitigation for NFS/BLM and non-NFS/BLM lands may be required if mitigation rates exceed what can be achieved on NFS/BLM land. This may be in the form of funding for land acquisition for inclusion into the Angeles National Forest or BLM lands affected by the Project, mitigation banking, removing existing structures, or comparable restoration efforts.
	1b During and after construction, USFS/BLM-identified potential or existing entrances to Project-related disturbed areas such as access/spur roads, pull sites, staging areas, fly yards, landing zones, etc. on NFS/BLM lands shall be gated, blockaded and/or concealed in some manner and maintained to prevent the unauthorized use by the general public. Signs prohibiting unauthorized use of these disturbance areas shall be posted on these barricades if deemed necessary by the USFS/BLM. If barricades are being compromised, law enforcement patrolling may also be implemented to control unauthorized access onto Project disturbance areas.
	1c **Treat cut tree stumps with Sporax.** All stumps of trees (conifers and hardwoods) resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the USFS.

TABLE BIO-MM-1. SUMMARY OF ESTIMATED IMPACTS TO VEGETATION COMMUNITIES ON FEDERAL LANDS

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Alternative 1								
Chamise Chaparral	USFS	16.73	3:1	50.19	56.06	1:1	56.06	106.25

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.30
Riversidian Sage Scrub	USFS	3.06	5:1	15.3	10.48	2:1	20.96	36.26
Southern Coast Live Oak Riparian Forest	USFS	0.05	5:1	0.25	0.38	2:1	0.76	1.01
Southern Cottonwood Willow Riparian Forest	USFS	0.42	5:1	2.1	0.86	2:1	1.72	3.82
Southern Mixed Chaparral	USFS	14.13	3:1	42.39	45.81	1:1	45.81	88.20
Southern Sycamore Alder Riparian Woodland	USFS	0.13	5:1	0.65	0.25	2:1	0.5	1.15
Southern Willow Scrub	USFS	0.32	3:1	0.96	1.30	2:1	2.6	3.56
Alternative 2								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	7.8	1:1	7.8	24.8	1:1	24.8	32.6
Mojave Creosote Bush Scrub	BLM	2.69	1:1	2.69	21.82	1:1	21.82	24.51
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.06	1:1	2.06	2.31
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.39	2:1	6.78	10.23
Southern Mixed Chaparral	USFS	3.24	3:1	9.72	8.77	1:1	8.77	18.49
Southern Riparian Scrub	USFS	0.33	3:1	0.99	0.66	1:1	0.66	1.65
Southern Sycamore Alder Riparian Woodland	USFS	0.87	5:1	4.35	2.2	2:1	4.4	8.75
Alternative 2a								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	3.24	1:1	3.24	12.72	1:1	12.72	15.96
Interior Live Oak Chaparral	USFS	2.06	5:1	10.3	5.60	2:1	11.2	21.5
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Scrub Oak Chaparral	USFS	1.46	5:1	7.3	3.19	2:1	6.38	13.68
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.40	2:1	6.8	10.25
Southern Mixed Chaparral	USFS	9.03	3:1	27.09	27.88	1:1	27.88	54.97
Southern Riparian Scrub	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland	USFS	0.81	5:1	4.05	1.64	2:1	3.28	7.33
Alternative 3								
Chamise Chaparral	BLM	0.00	1:1	0.0	0.02	1:1	0.02	0.02
Barren/developed	USFS	1.04	1:1	1.04	2.13	1:1	2.13	3.17
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	9.57	5:1	47.85	28.19	2:1	56.38	104.23
Scrub Oak Chaparral	USFS	2.87	5:1	14.35	5.83	2:1	11.66	26.01
Southern Riparian Scrub	USFS	0.34	5:1	1.7	0.69	2:1	1.38	3.08
New Circuit								
Chamise Chaparral	USFS	8.03	3:1	24.09	23.05	1:1	23.05	47.14
Riversidian Sage Scrub	BLM	0.04	1:1	0.04	0.34	1:1	0.34	0.38
Riversidian Sage Scrub	USFS	1.98	5:1	9.9	5.96	2:1	11.92	21.82
Southern Coast Live Oak Riparian Forest	USFS	0.08	5:1	0.4	0.66	2:1	1.32	1.72
Southern Cottonwood Willow Riparian Forest	USFS	0.40	5:1	2.0	0.80	2:1	1.6	3.6
Southern Sycamore Alder	USFS	0.09	5:1	0.45	0.19	2:1	0.38	0.83

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Riparian Woodland								
Reconductoring								
Chamise Chaparral (Segment ABG)	USFS	16.07	3:1	48.21	32.65	1:1	32.65	80.86
Barren/developed (Segment ABG)	USFS	7.77	1:1	7.77	25.28	1:1	25.28	33.05
Mojave Creosote Bush Scrub (Segment ABG)	BLM	2.85	1:1	2.85	23.16	1:1	23.16	26.01
Mojave Wash Scrub (Segment ABG)	BLM	0.23	1:1	0.23	1.86	1:1	1.86	2.09
Riversidian Sage Scrub (Segment ABG)	USFS	5.07	5:1	25.35	10.30	2:1	20.6	45.95
Southern Coast Live Oak Riparian Forest (Segment ABG)	USFS	3.25	5:1	16.25	6.60	2:1	13.2	29.45
Southern Mixed Chaparral (Segment ABG)	USFS	2.86	3:1	8.58	8.01	1:1	8.01	16.59
Southern Riparian Scrub (Segment ABG)	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland (Segment ABG)	USFS	0.95	5:1	4.75	2.34	2:1	4.68	9.43
Southern Coast Live Oak Riparian Forest (Segment K)	BLM	0.02	1:1	0.02	0.04	1:1	0.04	0.06
Southern Mixed Chaparral (Segment K)	BLM	0.00	1:1	0.0	0.01	1:1	0.01	0.01

Note: The permanent and temporary impact calculations provided above are estimates based on the impact model described in Appendix C of the Biological Resources Technical Report. Therefore, acreage numbers for the habitat types listed above may be smaller than those listed in the table. Preconstruction surveys will be conducted to estimate the acreage impacts and will be based on the final design not the impact model.

Mitigation Measure	Description
BIO-2	*The following prescriptions would prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.* 2a **Prepare and implement a Weed Control Plan.** LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. The Weed Control Plan, including monitoring and eradication, will be part of the 50 year Operations and Maintenance Permit. On ROW easement lands administered by the USFS/BLM, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations including consulting with CDFG on CESA species. The Weed Control Plan shall be submitted to the USFS/BLM for final authorization of weed control methods, practices, and timing before implementation of the Weed Control Plan on public lands. Weed control on BLM lands using pesticides would require site-specific NEPA analysis and an approved BLM Pesticide Use Permit. Pesticide Use Permits are issued for a maximum of three years. ROW easements on private lands shall include provisions such as wheel and equipment washing as part of implementation of the Weed Control Plan. The Weed Control Plan shall include the following stipulations: 1) A pre-construction weed inventory shall be conducted on NFS and BLM lands by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006); (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the USFS and/or BLM as species of priority (for NFS/BLM lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated before construction according to control methods and practices for invasive

Mitigation Measure	Description
	weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated and guide post-construction eradication and monitoring efforts. 2) Weed control treatments shall include all legally permitted herbicide application, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all State and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator. The most effective herbicides with the least toxic surfactant available shall be used. Herbicides shall not be applied during or within 24 hours of a 70% chance of occurring rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used. Herbicides shall not be applied by spray equipment when wind velocities exceed 6 mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied at wind speeds over 15 mph. In areas containing special-status plants or animals, there will be a 5- to 70-foot buffer where herbicides are not used. The size of the buffer will be determined and flagged for avoidance by an approved botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of adjacent native species, herbicide being used, method of herbicide application, concentration of herbicide being used based on no observed effect to non-target species, and/or environmental conditions and terrain. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds. Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by an authorized botanist. For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows. 3) On the ANF and BLM lands, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten, or until success criteria as outlined in the Weed Control Plan are met. Treatment of all identified weed populations shall occur at an appropriate interval so as to meet the success criteria. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that site. 4) During Project preconstruction and construction, all seeds and straw materials shall be weed-free when available, and all gravel and fill material shall be certified weed-free by the county Agriculture Commissioners' Offices. Any deviation from this must be approved by a USFS/BLM botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the USFS/BLM. 5) Before beginning preconstruction activities, the USFS and the BLM, in coordination with LADWP, will determine suitable locations to install field washing stations as part of the Weed Control Plan. Before commencing construction activities, LADWP shall document that all vehicles, equipment, and tools used on the Project have been cleaned at existing construction yard wash facilities or legally operating car washes. This is a one-time requirement designed to address the potential of new species of weeds being transported from outside the area. If, however, vehicles, equipment, or tools are used or driven off paved roads on non-NFS/BLM lands, washing must occur before entering USFS/BLM lands. During Project preconstruction and construction, all vehicles, equipment, or tools which will be used outside of permitted Project roadways shall be washed at the nearest wash station before operating off-road. In other areas also designated by the USFS/BLM, vehicles, equipment, and tools will be washed at the nearest wash station after exiting those areas. Vehicles that do not leave permitted Project roadways are not required to be washed after the initial washing described above. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the USFS/BLM. For NFS lands, plant material may also be removed by air compressors at USFS botanist/LADWP-approved locations. Written daily logs shall be kept for all vehicle/equipment/tool washing that records the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature

Mitigation Measure	Description
	of a responsible staff member. Logs shall be available to the USFS and BLM for inspection at any time and shall be submitted to the USFS and BLM permit administrators on a monthly basis. 6) During Project operation and maintenance activities, weeds shall be removed in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a USFS/BLM-approved method. 2b **Remove weed seed sources from construction access routes.** Before construction, LADWP shall initiate invasive species eradication along construction access routes to minimize the potential of weeds spreading aggressively during construction. Post-construction, these treatment areas will be included and treated according to the restoration plan. Per the Forest Service Manual (FSM) 2080 Best Management Practice (BMP) guideline, LADWP shall also remove or reduce sources of weed seed along the travel routes associated with Project construction. Weed species identified along the Alternatives and associated access roads include tocalote, artichoke thistle, tree tobacco, saltcedar, slender wild oat/wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, blessed thistle, filaree, shortpod mustard, prickly lettuce, common horehound, yellow sweetclover, rabbit foot grass, Mediterranean grass, sowthistle, rat-tail fescue, tree-of-heaven, giant reed grass, yellow starthistle, bull thistle, fennel, perennial pepperweed, and black locust.. To prevent the introduction or control the spread of invasive weeds, herbicide, hand removal or other control methods will be implemented to reduce seed production during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, LADWP shall identify, using an authorized plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF and BLM lands. Target infestations identified by Project surveys should be controlled before construction. LADWP shall initiate eradication of the target infestations discovered during pre-construction surveys along construction routes. 2c **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Before construction and during each year of construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF and BLM lands, weed-infested areas shall be hand-weeded and/or treated as appropriate for the individual weed species under the guidance of an authorized plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the USFS/BLM. Unless otherwise authorized by the USFS/BLM, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, bromes and other invasive weed seed production, by herbicide application or other control techniques prior to flowering. All plant debris shall be disposed of at a USFS/BLM approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by an authorized plant ecologist or restoration ecologist in coordination with LADWP and USFS/BLM botanist or weed specialist. 2d **Use of Herbicides to Control Exotic Weeds.** LADWP may use herbicides where deemed necessary for the control of invasive weeds within the Project area. Weed control shall be species-specific, and herbicides shall be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for the particular weed species. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. Any herbicide use on NFS lands would be subject to the review and approval of the appropriate USFS personnel and in coordination with LADWP. On BLM lands, herbicide use will be guided by an approved, site-specific Pesticide Use Proposal.
BIO-3	*Incorporate riparian area avoidance and permit measures.* The following actions and all permit conditions detailed within the U.S. Army Corps of Engineers individual or Nationwide 12 permit, CDFG 1602 Streambed Alteration Agreement, and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). 3a LADWP shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in RCAs without the authorization of the USFS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1 to August 15) unless otherwise approved by the USFS. LADWP shall prepare and implement a USFS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry

Mitigation Measure	Description
	crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal or tree trimming), monitoring requirements, and restoration requirements. This Plan shall be submitted to the USFS for approval before construction or the grading of any access road. **3b** Before construction, an authorized biologist shall stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones will include an appropriate buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities shall be restricted from these zones, although essential vehicle operation and foot travel will be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited within the exclusion zone. **3c** In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector and USFS, shall narrow the width of the road through the area to the minimum extent required for safe travel. New spur roads and existing access road improvements shall be constructed and implemented using methodology that preserves existing hydrology. **3d** Towers shall not be constructed in riparian areas. **3e** All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities shall be restored according to the guidelines of the Habitat Restoration Plan to the extent required to ensure no net loss of habitat functions and values. Following construction activities, the areas will be restored as soon as practicable. **3f** Permanent, unavoidable losses of riparian areas will be mitigated by restoration and/or preservation of off-site habitats, as outlined in the Habitat Restoration Plan. The final mitigation and off-site restoration locations will be determined in consultation with LADWP and the relevant permitting agency(s). Mitigation acreage ratios will be consistent with those listed in Table BIO-MM-1.
BIO-4	*Provide restoration/compensation for affected jurisdictional areas.* **4a** Impacts to areas under jurisdiction of the USACE, RWQCB, USFS and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible, including emergency repairs, and access/spur roads within RCAs, the applicant shall provide the necessary mitigation required as part of wetland permitting. This will include creation, restoration, and/or preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation will be determined in consultation with LADWP and the responsible agency(s) as part of the wetland permitting process. **4b** Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas.
BIO-5	*Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.* **5a.** Conduct preconstruction surveys in locations where potential habitat exists for special-status species to avoid impacts during construction. If wildlife sign or habitat is detected during the surveys, construction activities will be monitored by authorized biologists, or exclusion fencing will be placed around work areas. If federally listed species are found within the area of potential effect, the authorized biologist shall notify the construction manager and the USFWS. The construction manager, in consultation with the USFWS and the authorized biologist, will have the authority to halt all activities until appropriate avoidance measures have been completed. If non-federal special-status species are found within the area of potential effect, the USFS, BLM, and CDFG will be notified and, in consultation with these agencies, agreed-upon appropriate actions to address impacts to the species will be implemented. This only applies to species that are not listed under the California Endangered Species Act (CESA) unless authorized by an Incidental Take Permit (ITP) or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR). **5b.** Cover all steep-walled trenches or excavations used during construction to prevent entrapment of wildlife (e.g., reptiles and small mammals). If the trenches or excavations cannot be covered, escape ramps shall be placed into the trench or excavated area, or exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife, shall be inspected by the authorized biologists a minimum of three times per day and immediately before backfilling. All excavated areas shall be covered if left overnight. Furthermore, employees and contractors shall look under vehicles and equipment for the presence of wildlife before moving the vehicle or equipment. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is moved out of harm's way by an authorized biologist. Should a dead or injured special-status species be found in a trench or excavation or anywhere in the construction zone or along an access road, the

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	authorized biologist shall contact BLM and/or USFS (for activities on land managed by the agencies) and the Wildlife Agencies within 48 hours of the finding. The authorized biologist shall record the species found, the location of the finding, and the cause of death (if known), and shall submit a photograph and any other pertinent information; this information shall be submitted to the appropriate wildlife agency.
BIO-6	*Implement a Worker Environmental Awareness Program.* An authorized biologist(s) shall conduct a detailed biological Worker Environmental Awareness Program (WEAP) for all Project personnel before any construction or activities within the Project footprint. The WEAP shall include discussions of Project permits and brief summaries of their conditions; discussions of agency involvement, their applicable sensitivity measures, and relevant environmental protection legislation (e.g., the Endangered Species Act, the Migratory Bird Treaty Act); descriptions of special-status species and other sensitive resources that could exist in the Project area, along with their locations, legal status and protections; and a review of all measures to be implemented for avoidance of these sensitive resources. The final list of wildlife species to be included in the WEAP may be reduced at the discretion of the biologist with concurrence from applicable agencies. **6a.** Training materials and briefings shall also include the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS and BLM lands and identification of USFS and BLM sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. Discussion of GPs and BMPs shall include topics such as appropriate work limits, avoiding the spread of non-native plant species, fire safety, wildlife avoidance, trash and debris collection, spill prevention and containment protocol, and appropriate protocol for passage and/or construction near riparian zones. Sightings of sensitive wildlife species or harmful encounters with any wildlife species shall be reported to the authorized biologist immediately for evaluation and, as necessary, reporting to agencies. **6b.** Training materials and a course outline shall be provided to the USFS/BLM for review and approval at least 30 days before the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (e.g., limited operating periods) will be provided to the environmental monitors and construction crews before ground disturbance. **6c.** The training shall be conducted for all crew members present for the start of construction. If new crew members are brought to the Project after this time, they shall take part in the WEAP before beginning construction work; if the authorized biologist is not available at this time, new crew members shall be given a summary handout of the WEAP until the full WEAP can be administered by the authorized biologist, to be conducted no more than one workweek following the crew members' assignment to the Project. All crew members who have completed the WEAP shall submit their names to a list to be updated continuously and furnished to agencies upon request. No construction worker may work in the field for more than five days without participating in the WEAP.
BIO-7	*Impacts to Raptors.* **7a.** If Project construction activities cannot occur completely outside the bird breeding season, then pre-construction surveys for active nests shall be conducted by a qualified biologist within 1,200 feet of the construction zone no more than seven days before the initiation of construction that would occur between February 1 and August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG, BLM, and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the BLM and USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a species-specific buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The buffer (660-foot eagle and one-mile helicopter) may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance, with the approval of the U.S. Fish and Wildlife Service (USFWS), CDFG, BLM or USFS, as appropriate (USFS 2005). On NFS lands, the USFS shall apply the USFS Land Management Plan Standard S18 (Part 3 of the Land Management Plan), which states, "Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging." If for any reason a bird nest must be removed

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	during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. On BLM lands, this will include coordination and written approval by the BLM. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent. **7b.** Before construction, LADWP shall identify all existing raptor nests that would be affected by Project construction. LADWP shall coordinate with the USFWS, CDFG, USFS and BLM for the proposed removal of nests that may present safety issues associated with the construction activities. All nest removals shall occur after the nest is demonstrated to be inactive by a qualified biologist and have been shown to not result in take as defined by the Migratory Bird Treaty Act (MBTA).
BIO-8	*Avoid nesting season and limit disturbance of nesting birds.* LADWP shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, substation sites, access/spur road locations, or any other area subject to ground disturbance. Surveys for birds shall be conducted for all areas from February 1 to August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a 300-foot buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The 300-foot (or 660-foot eagle and one-mile helicopter) buffer may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance with the approval of the USFWS, CDFG, or USFS, as appropriate and in coordination with LADWP. On NFS lands, the USFS shall have the authority to define/redefine such buffers. The biological monitors shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The biological monitors shall be responsible for documenting the results of the surveys and the ongoing monitoring and will provide a copy of the monitoring reports for impact areas to the respective agencies (e.g., on NFS lands documentation will be provided to the Forest Biologist). If for any reason a bird nest must be removed during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent.
BIO-9	*No mitigation measures required for Impact BIO-9.*
BIO-10	*No mitigation measures required for Impact BIO-10.*
BIO-11	*Reduce avian electrocutions/collisions on transmission lines.* Raptor safety protection will be required on tower/conductor (lines) in appropriate locations. The Project would have minimum clearance between phase conductors or between phase conductors and grounded hardware, as recommended by the Avian Power Line Interactive Committee (APLIC 2006), that are sufficient to protect even the largest birds, such as California condor, and therefore would present little to no risk of bird electrocution. New Project structures shall be designed to implement collision-reducing techniques as described in the latest version of the APLIC guidelines. Devices such as swan wrapping or other similar functioning devices may be required if areas are identified as being a hazard to birds. In addition, per General Practice (GP) 8, an Avian Protection Plan will be developed for this Project that will include avian collision protocols.

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BIO-12	*No mitigation measures required for Impact BIO-12.*
BIO-13	*Protect special-status plant species and their habitat.* **13a.** Conduct preconstruction surveys for State and federal Threatened, Endangered, Proposed, Petitioned, Candidate, USFS Sensitive, USFS Watch, BLM Sensitive, and California Native Plant Society (CNPS) listed plants and avoid any occurrences of these plants. LADWP shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in a 250-foot radius around all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by an authorized plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS. The résumé of the proposed biologists will be provided to the USFS and BLM for concurrence before ground disturbance. The completion of these surveys shall be coordinated with the federal land manager. All listed plant species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with USFWS will occur. **13b.** Before site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance, including human trampling, erosion, and dust. The size of the buffer will depend upon the proposed use of the immediately adjacent lands, and include consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS, CDFG, USFS, and BLM and in coordination with LADWP. If impacts to listed plants are determined to be unavoidable, the USFWS shall be consulted for authorization, through the context of a Biological Opinion. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS before impacts are authorized, whichever is appropriate. **13c.** Impacts to non-listed plant species (i.e., USFS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other USFS or BLM approved methods. For USFS lands, if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of USFS Sensitive plant species, and reseeding/transplanting are not feasible options, LADWP shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).This ratio will apply only to specific acreage inhabited by special-status plant species that are removed during construction, and will supersede ratios listed in Table BIO-MM-1 regardless of habitat type. The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist. **13d.** All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the federal land manager (USFS and BLM) until the success criteria outlined in the Habitat Restoration Plan are met. Where reseeding has occurred, LADWP shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the federal land manager (USFS and BLM).
BIO-14	*Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat.* **14a** All Project activities taking place within suitable habitat for the western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo shall be conducted from November through early March, which is a period outside their breeding seasons (Sedgwick 2000, Sogge 2000, Brown 1993, Kus 2002, Hughes

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	1999). If these activities cannot be avoided during the breeding season, the following measures shall apply: **14b** If construction activities must occur during the breeding season in areas that have the potential to support listed riparian species, an authorized ornithologist shall conduct protocol surveys of the Project and adjacent areas within 500 feet to determine if this species is present within the area and to determine breeding status. USFWS protocol surveys will be conducted for southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (if no protocols exist, the appropriate land management agency will establish the protocols to be used). In known occupied habitat for listed riparian birds, LADWP shall only conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season. If breeding is confirmed, the USFWS-recommended buffers will be applied and no activities will occur within that buffer. **14c** Protocol or focused surveys, as appropriate, should be conducted within one year of start of construction. However, on NFS lands, annual surveys in suitable habitat may be required during construction. These surveys may be modified through the coordination with the USFWS, CDFG, USFS, LADWP and the BLM based on the condition of habitat, the observation of the species, or avoidance of riparian areas during the breeding season. **14d** If a territory or nest is confirmed, the USFWS and CDFG shall be notified immediately. On NFS or BLM lands, these agencies would be notified immediately. In coordination with the USFWS, CDFG and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A) hourly Leq at the edge of the nest site as determined by an authorized biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the biologist and USFS, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No construction or vehicle traffic shall occur within this buffer during the breeding season for these species. **14e** The nest must be monitored by an authorized biologist during the construction activities. If the monitor determines that Project activities are disturbing or disrupting nesting activities, the monitor shall notify the construction manager, and the construction manager, in consultation with the biological monitor, has the authority to implement measures to reduce the noise and/or disturbance in the vicinity. **14f** Because these species are State-listed as endangered by CESA, LADWP would apply for an ITP if take of any of these species is anticipated during Project construction.
BIO-15	*Protect coastal California gnatcatcher and its habitat.* **15a.** All Project activities taking place within suitable habitat for the coastal California gnatcatcher shall be conducted from September through February, which is a period outside their breeding season. If these activities cannot be avoided during the breeding season, the following measures shall apply: **15b.** LADWP shall conduct protocol surveys for coastal California gnatcatchers in areas supporting coastal sage scrub habitat that may be affected by the Project. In known occupied habitat for the California gnatcatcher, LADWP shall only conduct focused surveys for coastal California gnatcatchers. Survey areas shall include a 500-foot buffer around Project disturbance areas. **15c.** If a territory or nest is confirmed, the USFWS shall be notified immediately; on NFS or BLM lands, these agencies would also be notified immediately. In coordination with the USFWS and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A)hourly Leq at the edge of the nest site as determined by an authorized qualified biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the authorized biologist,

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	has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No Project activities may occur in these areas unless otherwise authorized by USFWS. LADWP shall obtain incidental take authorization from the USFWS before further activities. **15d.** Protocol or focused surveys, as appropriate, shall be conducted, at a minimum, within one year of start of construction. These surveys may be modified through the coordination with the USFS, BLM, and CDFG based on the condition of habitat, the observation of the species, or avoidance of nesting areas during the breeding season. **15e.** Construction activities in occupied gnatcatcher habitat will be monitored by a full-time authorized biologist. The monitoring shall be of a sufficient intensity to ensure that the biologist could detect the presence of a bird in the construction area. At a minimum, one full-time monitor shall be present for every two miles of active construction within occupied habitat. The monitors shall notify the construction manager, and the construction manager. in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed.
BIO-16	*Not applicable to MIS.*
BIO-17	*Not applicable to MIS.*
BIO-18	*Not applicable to MIS.*
BIO-19	*Protect California spotted owl.* Before construction activities within suitable habitat, LADWP shall have a qualified biologist conduct USFS protocol surveys for the California spotted owl to establish or confirm the location of nests within the Project. The résumés of the proposed biologists shall be provided to the USFS for concurrence. If nests or breeding pairs are found during the surveys, the limited operating period (LOP) will be applied according to the ANF Land Management Plan (Standard 20 – Part 3). No Project-related activities will be allowed within these dates (February 1 to August 15) or until chicks have fledged. Where a biological evaluation by a qualified ornithologist determines that a nest site would be shielded from planned activities by topographic or other features that would minimize disturbance, the buffer distance may be reduced upon approval of the USFS on NFS lands. In addition, no helicopter overflights shall be authorized without USFS approval. If approved, minimum altitudes will be 300 feet above a territory at an altitude designated by the USFS. This buffer may be adjusted through consultation with the USFS.
BIO-20	*Not applicable to MIS.*
BIO-21	*Protect sensitive bat species.* **21a** **LADWP shall conduct a pre-construction survey** (e.g., vegetation removal, grading) for roosting bats within 200 feet of Project activities within 15 days before any grading of rocky outcrops or removal of trees (particularly trees 12 inches in diameter or greater than 4.5 feet above-grade with loose bark or other cavities). 1) LADWP shall also conduct surveys for roosting bats during the maternity season (March 1 to July 31) within 300 feet of Project activities. Trees, rocky outcrops, and mine features shall be surveyed by a qualified bat biologist (i.e., a biologist holding a CDFG collection permit and a Memorandum of Understanding with CDFG allowing the biologist to handle bats). Surveys duration shall be a minimum of one day and one evening. The résumé of the biologist shall be provided to the USFS and BLM (as appropriate) for concurrence before any Project activities. 2) If active maternity roosts or hibernacula are found, the rock outcrop or tree occupied by the roost shall be avoided (i.e., not removed) by the Project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/USFS/BLM approved methods) for nearby alternative maternity colony sites. If the bat biologist determines, in consultation with and with the approval of the CDFG, USFS, and BLM (as appropriate), that there are alternative roost sites used by the maternity colony and young are not present, no further action is required, and it will not be necessary to provide alternative roosting habitat (i.e., Mitigation Measure BIO-21b would not apply, although Mitigation Measure BIO-21c would still apply). However, if there

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	are no alternative roost sites used by the maternity colony, Mitigation Measure BIO-21b is required. If no active roosts are found, no further action is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, Mitigation Measure BIO-21b is not necessary, but Mitigation Measure BIO-21c is required. **21b** **Provision of substitute roosting bat habitat.** If a maternity roost will be impacted by the Project, and no alternative maternity roosts are in use near the site, substitute roosting habitat for the maternity colony shall be provided on, or close to, the Project site no less than three months before the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats' requirements in coordination with CDFG and ANF. By making the roosting habitat available before eviction (Mitigation Measure BIO-21c), the colony will have a better chance of finding and using the roost. Large concrete walls (e.g., on bridges) on south or southwestern slopes that are retrofitted with slots and cavities are an example of structures that may provide alternative roosting habitat appropriate for maternity colonies. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The appropriate agencies shall also be notified of any hibernacula or active nurseries within the construction zone. Construction will not proceed in proximity of active hibernacula or nurseries until approved by appropriate agencies. Exclude bats before demolition of roosts. If non-breeding bat hibernacula are found in towers or trees scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted upon the approval of appropriate agencies and under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). The résumé of the bat biologist shall be provided to the CDFG, USFS, and BLM (as appropriate) for concurrence before any Project activities. In situations requiring one-way doors, a minimum of one week shall pass after doors are installed, and temperatures should be sufficiently warm for bats to exit the roost, because bats do not typically leave their roost daily during winter months in southern coastal California. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal). 1) If an active maternity roost is in an area to be impacted by the Project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., before March 1) or after young are flying (i.e., after July 31) using the exclusion techniques described above. **21c** **Survey for bat nursery colonies.** A CDFG-approved biologist shall conduct a habitat assessment for bat nursery colonies before any construction activity. The approved biologist shall then conduct a survey for bat nursery colonies or signs of such colonies before construction. Direct impacts to a nursery colony site shall not be allowed, and approach of, or entrance to, an active nursery colony site shall be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist shall work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active). The methods shall include an option to halt any construction activity that would cause falling rock, substantial vibration impacts, or any other construction-related impact to a nursery colony as determined by the approved biologist, until the colony is inactive. Should falling rock block the entrance to a nursery colony site, the contractor shall work with the approved biologist to reopen an entrance to the site. **21d** If habitat must be removed for construction to continue, a two-step removal process will be implemented. The two-step removal process will involve permitted biologists to alter the habitat outside of the season of use (i.e., outside of hibernating/maternity season) to make the habitat less suitable, and the following day the habitat will be removed under the supervision of the permitted biologist.
BIO-22	*Not applicable to MIS.*
BIO-23	*Protect desert tortoise and habitat loss.* **23a** In areas of suitable desert tortoise habitat, preconstruction clearance surveys according to USFWS protocol will be conducted by authorized biologists. Surveys will be conducted by an authorized biologist and will provide 100 percent coverage of all areas to be disturbed during construction. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises will be examined to assess

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	occupancy of each burrow by desert tortoises and processed in accordance with the current USFWS guidelines (USFWS 2009d). If tortoise is observed or sign is found, construction activities will be monitored by a biologist authorized by the USFWS. If no tortoise sign is found, monitoring by an authorized biologist would not be required. Should a tortoise wander into non-monitored construction sites, all ground-disturbing activities will stop and a biologist approved to handle desert tortoise will be called to the site to move the tortoise out of harm's way, and the remainder of construction in desert tortoise habitat shall be monitored by an authorized biologist.
23b	Vehicular traffic during construction in desert tortoise habitat will be confined to existing routes of travel to and from the Project site, and cross-country vehicle and equipment use outside designated work areas will be prohibited. Where new access is required outside of existing roads (e.g., new spur roads) or the construction zone, the route will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction and desert tortoise clearance surveys will be conducted. During the desert tortoise active season (March to May and September to October), speed limits along Project roads shall be limited to 15 mph in desert tortoise habitat.
23c	Burrows within the construction zone or along access routes shall be flagged by the authorized biologist so that the qualified biologist would be able to more easily locate them during construction. The authorized biologist shall be on-site to monitor all construction that occurs in the vicinity of flagged burrows and to ensure that desert tortoise impacts are avoided during Project construction. All desert tortoise burrows or pallets in the construction area shall be excavated by the USFWS-authorized biologist if they cannot be avoided by Project realignment. The construction area includes the expansion area of the Barren Ridge Switching Station (235 feet) and 500 feet total or 250 feet on either side of the new 230 kV transmission line. The 250 feet on either side of the transmission line account for the access roads, spur roads, tower assembly, and installation. The staging sites and concrete batch plants will not be placed within the desert tortoise habitat.
23d	Desert tortoises that are found above ground in active construction areas shall be placed out of harm's way in the shade of a shrub or other cover location by the USFWS and BLM-authorized biologist. Any desert tortoise removed from burrows shall be placed in an unoccupied burrow of approximately the same size as the one from which it was removed. Tortoises shall not be placed more than 1,000 feet from where they were found. If an existing burrow is unavailable, the authorized biologist shall construct or direct the construction of a burrow of similar size, shape, depth, and orientation as the original burrow. Desert tortoises moved during inactive periods would be monitored for at least one week after placement in the new burrows to ensure their safety. of its own accord, activities would be halted until the authorized biologist is able to move it out of harm's way.
23e	Any time a vehicle is parked, the ground around and under the vehicle shall be inspected for desert tortoises before the vehicle is moved. If a desert tortoise is observed, it shall be left to move on its own. If the tortoise does not move within 15 minutes, the authorized biologist shall relocate the tortoise out of harm's way, but no more than 1,000 feet from its original location. Moving desert tortoise from harm's way will only occur on the transmission line portions of the Project. A desert tortoise translocation plan may be needed if desert tortoises are found within the Barren Ridge Switching Station expansion site; the authorized biologist shall contact the USFWS for guidance on developing this plan.
23f	Within potential desert tortoise habitat areas, vehicles shall not exceed 20 miles per hour on access roads during the period of highest desert tortoise activity (March 1 through October 31).
23g	Tower foundations or other excavations that pose a potential to entrap or injure desert tortoise shall be inspected three times daily until the foundation or other structure is in place and the excavation is filled in. Excavations also will include an escape ramp.
23h	The Project Worker Environmental Awareness Program (WEAP) will include information on desert tortoise. The program will be presented to all personnel who will be onsite at any time, including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. This program will be presented in English and Spanish, if appropriate, and contain information concerning the biology and distribution of the desert tortoise as it is relevant to the Proposed Action, its legal status and occurrence in the proposed Project area, the definition of "take" and associated penalties, the terms and conditions of this biological opinion, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when tortoises are encountered or in cases of non-compliance with the Biological Opinion. The name of each individual trained will be recorded on a sign-in sheet and will become part of the environmental compliance permanent record.

Mitigation Measure	Description
	23i A litter-control program will be implemented to reduce the attractiveness of the area to opportunistic desert tortoise predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed of properly in predator-proof containers with re-sealing lids. Trash containers will be emptied, and construction waste will be removed daily from the Project area and disposed of in an approved landfill.
	23j LADWP shall report any observations of raven predation on desert tortoises in the Project area to CDFG and USFWS. In construction areas that are heavily used and in potentially occupied desert tortoise habitat, work and staging areas, including the locations of the transmission line under construction, may be fenced with approved temporary desert tortoise exclusion fencing in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. An authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the USFWS, CDFG, and with the BLM when construction areas are within lands administered by the BLM. All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed or conducted by an authorized biologist. The fencing will remain in place for the duration of construction activities at a particular location and will be removed when construction activities are complete. **1)** Temporary fencing should consist of 1-inch mesh or 1-inch horizontal by 2-inch vertical mesh (hardware, cloth or plastic) and be installed flush with the ground and extend at least 18 inches above-ground. Temporary tortoise-proof fencing should not be buried. In areas of high rodent activity where plastic mesh is used, temporary fencing may need more frequent monitoring to ensure no breaches exist. A desert tortoise authorized biologist will inspect the fencing on a biweekly basis to ensure that no holes develop that could allow desert tortoises to enter the work areas. If holes are found, they will be repaired immediately. **2)** If a desert tortoise is found within an area that has been fenced to exclude them, activities will cease until an authorized biologist moves it out of harm's way outside of the fence, no greater than 500 meters away from its original location. At this time, the fencing will be inspected for holes, and any breaches in the fence will be immediately repaired.
	23k No pets or firearms will be permitted in the work area.
BIO-24	*Protect arroyo toad and California red-legged frog.*
	24a **LADWP shall conduct USFWS-approved protocol surveys for arroyo toads and California red-legged frogs at all locations containing suitable habitat near the proposed construction sites** within two years before the start of construction.
	24b If arroyo toads are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no arroyo toads are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) LADWP shall retain an authorized biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and assist LADWP in the implementation of the monitoring program. The résumés of the proposed biologists will be provided to the USFS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad. 2) All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFS and the authorized biologist. LADWP shall provide information on the general location of construction activities within habitat of the arroyo toad and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, LADWP, USFS, USFWS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on arroyo toads. 3) Any arroyo toads found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in areas that contain suitable habitat. 4) If the authorized biologist determines that Project activities are disturbing the species, they shall notify

Mitigation Measure	Description
	the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 5) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 6) LADWP will avoid ground disturbing activities (e.g., grading, stream crossing upgrades, parking) along access roads within a 1.0 mi (1.6 km) buffer of occupied stream habitat for arroyo toads during the activity period for arroyo toads (March through November). This date and buffer may be modified based on the existing temperature regime and habitat conditions, with Angeles National Forest approval. 7) LADWP will limit use of the access roads in areas known to support arroyo toad within a 1.0-mile (1.6 km) buffer to daylight hours only during the activity period for arroyo toads (generally March through November). Use of these roadways during rain events will not occur during the activity period for arroyo toads. Vehicle speeds will be limited to 15 mph (24 kph), and no parking or loitering will occur along the access roads. An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code. 8) No stockpiles of materials will occur in areas occupied by arroyo toads. 9) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain arroyo toads will be reported to the USFS and USFWS within one hour. 10) For each ac/ha of arroyo toad occupied habitat that is permanently impacted on the Angeles National Forest, five ac/ha of arroyo toad occupied habitat will be conserved in the vicinity of the impacted habitat (i.e., impacts will be offset at a habitat ratio as required by the final Biological Opinion).
24c	If California red-legged frogs are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no California red-legged frogs are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) All trash that may attract predators of red-legged frogs will be removed from work sites or completely secured at the end of each work day. 2) Between November 1 and March 31, no work will be authorized within one mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. The one-mile buffer distance may be reduced based on the topography of the site, with the approval of the USFWS and the USFS. 3) If and as required by USFWS, between April 1 and October 31, no work will be authorized within 0.5 mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. 4) If and as required by USFWS, from November 1 thru March 31, overflights will be restricted to a minimum altitude of 1,000 feet (305 m) from the stream bottom within 1.0 mile (1.6 km) of a California red-legged frog occupied stream. 5) Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFWS and the USFS-approved biologist (authorized biologist). The authorized biologist shall hold a current red-legged frog permit from USFWS. LADWP shall provide information on the general location of construction activities within habitat of the red-legged frog and the actions taken to reduce impacts to this species. Because red-legged frogs may occur in various locations during different seasons of the year, LADWP, USFWS, USFS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on red-legged frogs. 6) Where construction would occur in habitat where red-legged frogs are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the LADWP and the responsible agency(s). All workers will be advised that equipment and vehicles must remain within the fenced work areas. 7) The authorized biologist will direct the installation of the fence and conduct a minimum of three nocturnal surveys. If red-legged frogs are observed on the final survey or during subsequent checks,

Mitigation Measure	Description
	the authorized biologist shall halt construction and report to the USFWS and the USFS immediately. 8) Fencing to exclude red-legged frogs will be at least 24 inches in height. 9) Construction activities that may occur near breeding pools or other areas where large numbers of red-legged frogs may congregate will be conducted during times of the year when individuals have dispersed from these areas (i.e., winter) or the species is dormant, unless otherwise authorized by the USFS and USFWS. The authorized biologist will assist LADWP in scheduling its work activities accordingly. 10) Any red-legged frogs found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in the work area. 11) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 12) LADWP shall avoid nighttime activities when red-legged frogs may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area. 13) An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible, and ensure that activities are in compliance with the California Fish and Game Code. 14) No stockpiles of materials will occur in areas occupied by California red-legged frogs. 15) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 16) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain California red-legged frogs will be reported to the USFS and the USFWS within one hour.

5.0 EXISTING ENVIRONMENT

The physiography of the Project area in the Los Angeles and Kern County regions from north to south is the flat Antelope Valley gradually rising in elevation (Northern region) and giving way to the foothills of the Angeles National Forest (Central region). Continuing south, the foothills gradually give way to the City of Santa Clarita (Southern region). Drainages originating from the foothills of the ANF have carried rock detritus and water to the Santa Clarita area. This has produced several riparian areas, which support a rich, varied, and unique ecosystem. The diversity and distribution of biological resources within the study corridor are a function of the regional climate, soils, and topography. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species. To provide baseline conditions for the dominant soil type, water and habitat characteristics the biological study was divided to three ecotype regions (Northern, Central and Southern). The Northern and Southern regions of the Project do not occur within the ANF at all and are not discussed further. The Central region of the BRRTP encompasses the southern ends of Alternatives 1, 2, 2a, and 3, as well as Segment J (new 230 kV circuit between Haskell Canyon and the Castaic Power Plant), and is discussed below in greater detail.

5.1 CENTRAL REGION – ANF BOUNDARIES

Alternatives 1, 2, 2a, 3, the new 230 kV circuit (Segment J), and reconductoring component within the ANF are located in steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands (Table 6). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the

Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

TABLE 6. SOIL TYPES PRESENT IN CENTRAL REGION

Segment	Soil Series	Drainage Class	Series Soil pH
Alternative 1	Cortina	Excessively drained	Slightly acid
Alternative 1	Hanford	Well drained	Slightly alkaline
Alternative 1	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 1	Millsholm	Well drained	Neutral to slightly acid
Alternative 1	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 1	Osito family	Well drained	Neutral to slightly acid
Alternative 1	Rock outcrop	N/A	Neutral
Alternative 1	Saugus	Well drained	Slightly acid
Alternative 1	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Amargosa	Excessively drained	Neutral
Alternative 2/ Reconductor	Chino	Excessively drained	Moderately alkaline
Alternative 2/ Reconductor	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Greenfield	Well drained	Neutral
Alternative 2/ Reconductor	Hanford	Well drained	Slightly acid
Alternative 2/ Reconductor	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Millsholm	Well drained	Slightly acid
Alternative 2/ Reconductor	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 2/ Reconductor	Ramona	Well drained	Moderately acid
Alternative 2/ Reconductor	Rock outcrop	N/A	Neutral
Alternative 2/ Reconductor	San Andreas family	Well drained	Moderately acid
Alternative 2/ Reconductor	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Tujunga family	Excessively drained	Slightly acid
Alternative 2/ Reconductor	Vista	Well drained	Neutral
Alternative 2/ Reconductor	Yolo	Well drained	Neutral
Alternative 2a	Amargosa	Excessively drained	Neutral
Alternative 2a	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2a	San Andreas family	Well drained	Moderately acid
Alternative 2a	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 3	Amargosa	Excessively drained	Neutral
Alternative 3	Anaverde	Well drained	Neutral
Alternative 3	Castaic	Well drained	Slightly acid
Alternative 3	Cortina	Excessively drained	Slightly acid
Alternative 3	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 3	Godde	Well drained	Slightly acid
Alternative 3	Greenfield	Well drained	Neutral
Alternative 3	Hanford	Well drained	Slightly acid
Alternative 3	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 3	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 3	Mocho	Well drained	Moderately alkaline
Alternative 3	Saugus	Well drained	Neutral to slightly acid
Alternative 3	Vista	Well drained	Neutral
Alternative 3	Wyman	Well drained	Neutral
Alternative 3	Yolo	Well drained	Neutral
New 230 kV Circuit	Castaic	Well drained	Slightly acid
New 230 kV Circuit	Hanford	Well drained	Slightly acid
New 230 kV Circuit	Metz	Somewhat excessively drained	Moderately alkaline
New 230 kV Circuit	Millsholm	Well drained	Slightly acid
New 230 kV Circuit	Mollic Haploxeralfs	Well drained	Extremely acid
New 230 kV Circuit	Rock outcrop	N/A	Neutral

Segment	Soil Series	Drainage Class	Series Soil pH
New 230 kV Circuit	Saugus	Well drained	Neutral to slightly acid
New 230 kV Circuit	Zamora	Well drained	Neutral

Within the central eco-region boundary, the vegetation composition is predominantly shrubs, approximately 137,000 acres. The eco-region is dominated by mixed chaparral series with a sparse mixture of deciduous and pine forests, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin. Predominant plant species include *Juniperus californica* (California juniper), *Pinus coulteri* (Coulter pine), *Pinus sabiniana* (Gray pine), *Quercus* spp. (Oak species), *Ceanothus* spp. (Sugar Brush), *Arctostaphylos glauca* (Big Berry Manzanita), and *Adenostoma fasciculatum* (Chamise). There are three major drainages and several small drainages that originate from the foothills of the Angeles National Forest and spread over the northwestern Los Angeles County region. The San Francisquito Canyon Creek, a minor drainage in the area, has several small tributaries. A second drainage, originating from Bouquet Reservoir, is Bouquet Canyon Creek. The third drainage, Santa Clara River, has several small tributaries, including Mint Canyon Creek, Rowher Canyon Creek, and Aqua Dulce Canyon Creek. The Santa Clara River also has two minor tributaries, San Francisquito Canyon Creek and Bouquet Canyon Creek. Many reaches of these natural and modified stream channels have the ability to support riparian areas and function as wildlife corridors.

Wildfires are an integral part in the biodiversity of plant and animals ecosystems in Southern California (Zedler 1995). Several fires have occurred in the Central region and the largest of the burned areas within the Project area occurred during the 2009 Station Fire, which burned 161,000 acres, 154,000 acres of which were within Forest Service lands. Within the last fifty years, there have been nine fires that have burned over 10,000 acres within the Project area. Another recent large wildfire was the 2007 Buckweed Fire, which burned approximately 40,000 acres east of Santa Clarita and to the north of State Route 14.

The chaparral-shrubland community is highly tolerant to the disturbance of fire and will generally dominate a burned site several decades after a fire. The ability for chaparral plant communities to recover from fire is highly favorable, contributing to plant succession by influencing the germination of seeds and the stimulation of spouting seedlings. Early successional plant species, including native and non-native grasses and perennials, will generally dominate a burned site for the first several years after a fire. However, negative impacts have been associated with the increase in frequency of Southern California's large fires. Changes in dominant vegetation communities dramatically affect the habitat for plant and animal species. For example, the coastal California gnatcatcher is dependent primarily on coastal sage scrub vegetation. If this vegetation is burned too many times, it may convert to non-native grassland or a disturbed habitat that would preclude its use by the gnatcatcher. The introduction of non-native species in recent burn areas significantly affects forest and rangeland ecosystems. Non-native invasive grass species such as Cheat Grass (*Bromus tectorum)* favors disturbed areas and establishes itself strongly, out-competing native plant habitat. These introduced annuals cure early and remain flammable during a long fire season, thereby increasing the frequency of wildfire because of the abundance of early cured fine fuels (POWER 2010d). Fires often cause a short-term increase in productivity, availability, or nutrient content of forage. These changes can contribute to substantial increases in herbivore populations, but potential increases are moderated by animals' ability to thrive in the altered, often simplified, structure of the post-fire environment. Large, high-intensity fires that denude the landscape of many shrubs and trees reduce habitat quality for species that require dense cover and improve it for species that prefer open sites. Thus, habitat changes (e.g., alteration of cover protection and available food resources) occurring from a wildfire could be more detrimental to faunal populations and communities than fire itself. In many desert and semi-desert habitats, the history of wildfire occurrences is fairly infrequent because of sparse fuels.

6.0 EFFECTS OF PROPOSED PROJECT ON SELECTED MIS

This section discusses known information about MIS occurrence within or near the Project area, population trends over time, the amount of potentially available and affected suitable habitat, and a discussion on the effects of implementing the proposed Project. Detailed information on MIS for the ANF is documented in the ANF MIS Report (USFS 2008).

6.1 DIRECT AND INDIRECT IMPACTS SUMMARY

Both direct and indirect impacts are expected to occur to vegetation and wildlife. Direct impacts are defined as those that occur at the same time and place as BRRTP or the surrounding projects mentioned in Section 6.2. Indirect impacts are defined as those which could be caused by BRRTP or surrounding projects, but which would occur at a later time or occur at a distance farther removed from the direct construction corridor. While all of the direct and indirect impacts below could possibly occur due to BRRTP, not all may necessarily apply to each project listed in the next section. However, any common direct or indirect impacts between BRRTP and any of the listed projects would exert cumulative effects of varying degrees on certain species or groups of species.

Direct Impacts

- Habitat loss, fragmentation, or degradation (short-term and long-term);
- Direct injury or mortality;
- Disturbance of management indicator species (dust deposition on or crushing of plants, disturbance of an animal's daily activities or natural history); and
- Dispersal of local wildlife (including mortality of young for nesting wildlife).

Indirect Impacts

- Habitat degradation (spread of non-native plant species, soil compaction);
- Indirect injury or mortality (dispersal leading to increased predation risk and/or competition, ingestion of construction debris);
- Reduction in water quality due to insufficient erosion control; and
- Avian collisions and/or electrocutions.

6.2 CUMULATIVE EFFECTS FOR MIS

For analysis of cumulative effects, the action area is defined as the proposed corridor within the Angeles National Forest, on each Alternative for each Project component, along with a five-mile boundary of projects that may occur in the vicinity of the BRRTP. Additionally, any other major projects that may affect individual species, such as Southern California Edison's (SCE's) Tehachapi Renewable Transmission Project, were included.

6.2.1 Past, Present and Reasonable Foreseeable Actions

The major cumulative projects in the BRRTP area include: 1) Electricity Transmission Projects; 2) Power Generation Projects; 3) Transportation and Public Facilities Projects; 4) Community Development Projects; 5) Recreation Projects; 6) Maintenance/Landscaping Projects; and 7) Local Development Projects. However, because most of these projects are not on the ANF, they are not considered for analysis.

Numerous energy infrastructure, wind, and solar generation projects are in various stages of planning and development within the Project vicinity. Below are brief descriptions of projects that occur in the BRRTP vicinity of the ANF or could have cumulative effects on MIS species affected by BRRTP within the ANF.

Transmission Projects

Antelope Transmission Project (ATP) – Construction of Southern California Edison's (SCE's) proposed Antelope Transmission Project is underway and is proceeding in three sequential segments. Construction of Segments 1, 2 and 3A have been completed. Construction of Segment 3B, from Windhub Substation to and including Highwind Substation, has not started and no schedule has been developed by SCE (California Public Utilities – Current Projects).

Segment 3 of the Antelope-Tehachapi Transmission Line consists of two phases. The first phase would involve the construction of a new 26.1-mile 500 kV transmission line between the Antelope Substation and a proposed new substation in the Mojave area (Substation 1). Similar to Segments 1 and 2, this line would be initially energized at 220 kV and upgraded to meet future needs. The second phase would involve the construction of a new 9.4-mile 220 kV transmission line from the proposed Substation 1 to a proposed new substation in the Monolith area (Substation 2).

Tehachapi Renewable Transmission Project (TRTP) – SCE is proposing to construct the TRTP, which would involve new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way in southern Kern County, portions of Los Angeles County including the ANF, and the southwestern portion of San Bernardino County. Stated objectives for the project include providing the electrical facilities necessary to integrate levels of wind generation in excess of 700 MW and up to approximately 4,500 MW in the Tehachapi Wind Resource Area. The environmental review process for the project is currently underway. Construction began in April 2010 on approved sections. Project construction is estimated to be completed in 2015. The project is composed of Segments 4 through 11; however, only Segments 4, 5, and 10 are located within the Project area.

Segment 4 would consist of constructing two new single-circuit 220 kV transmission lines within four miles of new ROW between the Cottonwood Substation and proposed Whirlwind Substation. SCE also proposes construction of a new single-circuit 500 kV transmission line within 16 miles of new ROW between the Antelope Substation and proposed Whirlwind Substation.

Maintenance/Landscaping Projects

Bee Canyon Sag Pipe Cement Lining Project – This LADWP Operations and Maintenance (O&M) project involves the patching and coating of the interior of the Bee Canyon Sag Pipe. Originally constructed circa 1910, the current interior lining has been determined to be insufficient and outdated with current standards of safety and quality.

City Highline Road Grading – This LADWP O&M project involved the grading of approximately five miles of City Highline Motorway Fire Road in spring 2009 without the approval of the ANF. This resulted in road grading through 23 RCAs and on a portion of road running perpendicular and immediately adjacent to water. In addition, ten live oak trees were trimmed during the process.

Elizabeth Tunnel Emergency Repair Project – This LADWP O&M project involved an emergency repair and sediment removal at the South Portal of the Elizabeth Tunnel. The layer of sediment that normally covers the tunnel entrance was found to have been washed off and had accumulated in front of the entrance. The sediment was removed and placed back against the tunnel entrance.

Littlerock Recreation Area – The proposed project would reopen Little Rock Creek Road (Forest Road 5N04) to non-motorized and motorized vehicle use, including OHVs, as well as reopen Alimony Truck Trail (Forest Road 4N15) to non-motorized and street-legal motorized vehicles only. It would also reopen a portion of the current closure area within the Littlerock Recreation Area. Forest Road 5N04 runs alongside Little Rock Creek, while Forest Road 4N15 runs alongside an unnamed intermittent creek. A decision was expected in April 2012 and implementation was expected for May (USFS 2012).

Livestock Grazing Allotments – This ANF project involved the closing of selected grazing allotments within the ANF. There are six grazing allotments that were historically grazed but have not been used for this purpose for several years, the longest being since 1993 and the most recent since 2002. The allotments included a total of 50,854 acres of NFS lands on the ANF (USFS 2011).

San Francisquito/Bouquet Creek Weed Removal Project – In 2010, the Forest Service removed invasive weeds along approximately 2.5 miles of stream in the San Francisquito and Bouquet Creek watersheds. This habitat was suitable for the Forest Service Sensitive species arroyo chub (USFS 2010a).

Santa Clara River Watershed Invasive Plant Treatment Project – This project proposal by the ANF is located in the Santa Clara River Watershed entirely on ANF grounds. It includes approximately 262,000 acres and 744 miles of stream channels and involves the proposed eradication, control, containment, and/or suppression of existing and new infestations of non-native plant species within the Santa Clara River Watershed. Proposed treatment methods involve biological control, manual/mechanical control, burning, and herbicide (USFS 2011).

7.0 EFFECT ANALYSIS

7.1 MULE DEER (*ODOCOILEUS HEMIONUS*)

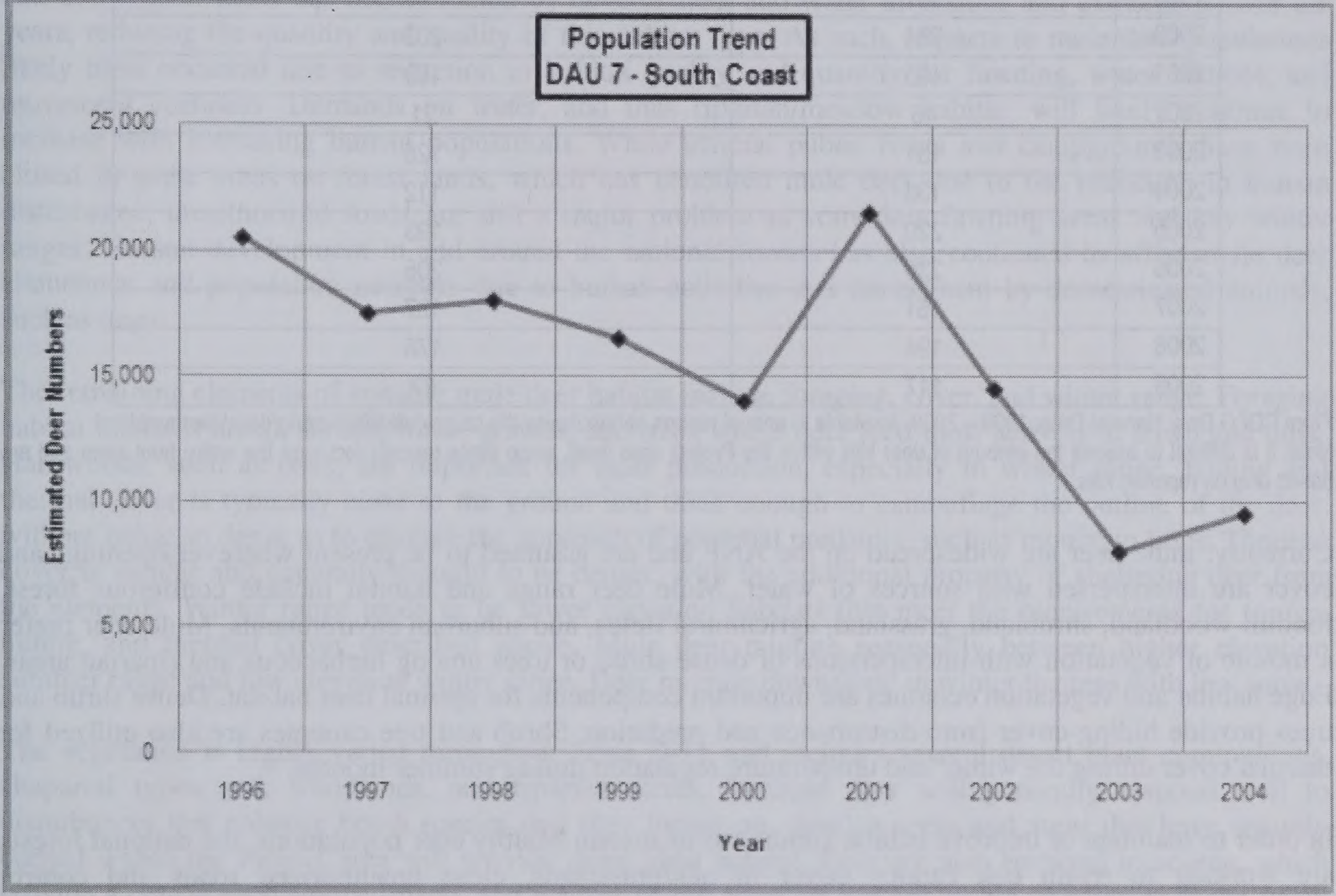
7.1.1 Habitat/Species Relationship

The mule deer was selected as an MIS for forest health according to vegetation, road, and recreation management. In addition, mule deer can be used to evaluate the effects of the different strategies in the LMP alternatives for vegetation and road management (USFS 2005b, Volume 1, pages 24 – 59; Volume 2, Page 77). They are associated with all habitat types and are affected by roads and recreation along with management that modifies vegetation diversity and age class mosaics. According to the Forest Service FEIS (USFS 2005b, Volume 2, page 77), the objective for mule deer on the ANF is to have well-distributed and stable or increasing populations. Trends in mule deer populations are monitored through cooperation with the CDFG in their ongoing surveys. Changes in mule deer abundance are partially due to Forest Service actions and management. However, because mule deer are affected by many different interacting relationships, mule deer abundance is related to deer herd size, hunting, human actions and developments, and vegetation management on private and public wildlands. Because maintaining suitable mule deer habitat is an important management objective for the National Forests of Southern California, it is important for the Forest Service to engage in interagency monitoring efforts of deer population abundance and habitat condition.

The area within the ANF that contains the Project area is located in Deer Hunt Zone D-11, which is part of Deer Assessment Unit (DAU)-7 South Coast. Overall, the DAU-7 deer population is considered to be decreasing by the CDFG (USFS 2008).

Mule deer in the Project area are part of the Los Angeles Deer Herd, which includes individuals throughout the San Gabriel Mountains of Los Angeles County. Population estimates were made for the San Bernardino Mountains and the Los Angeles Mountain deer herds in 2004 by the CDFG, which estimated the Zone D-11 2004 pre-hunting season population to be 4,180 and the 2007 pre-hunting season population to be 6,440 (USFS 2008). The deer population in Zone D-11 is considered stable to slightly declining, and far below population levels recorded in the late 1960s and 1970s (USFS 2008). Figure 7 illustrates the population trend for the deer in DAU-7 from 1996-2004, showing that even within this time period there appeared to be a pronounced drop in the South Coast mule deer population. This long-term population decline appears to be the case with most deer herds in California and other western states. Generally speaking, long-term population declines have been the result of land management practices that have mostly avoided fires, resulting in changes toward more mature and less diverse habitats and reducing the amount of available mule deer habitat. Occasional short-term fluctuations in deer populations are typically the result of weather events that influence forage production (USFS 2008).

FIGURE 7. MULE DEER DAU-7 POPULATION TREND, 1996-2004



Source: USFS 2008

The subspecies of deer in Zone D-11 is the California mule deer, which are considered resident deer for this area. That is, their movements are predominantly elevational and they do not make long seasonal migrations (USFS 2008). The deer in Zone D-11 generally move to higher elevations in late spring, where they remain until heavy fall storms force them downslope again. An estimate of annual deer losses in the ANF can be made from the reported deer hunting kill records for Zone D-11 provided in Table 7 below. It should be noted that these numbers are reported kills and that estimates of actual deer kills may be higher. Furthermore, while these numbers represent the reported annual deer kills for Zone D-11, the actual proposed BRRTP area only includes a small section of this zone in the Santa Clara/Mojave Rivers Ranger District, and deer populations and kills within this area may be much less than the numbers reported for the entire zone. Although exact locations of deer kills are unknown, areas that CDFG considers to be "popular and productive" for deer hunting in the Project area's vicinity include Bouquet Canyon, Drinkwater Flat, Castaic Lake, and Lake Elizabeth (CDFG 2010a). Of these, only Drinkwater Flat is within the ROW on Alternative 2, whereas Castaic Lake is located immediately north of the ROW for the reconductoring of the existing BR-RIN line. Bouquet Canyon is approximately two miles east of Alternative 2 at its closest point, while Lake Elizabeth is located approximately 0.6 mile west of Alternative 2. Areas that CDFG considers popular and productive for mule deer that are located slightly farther from the Project's ROWs include Liebre Mountain, Necktie Basin, and Sierra Pelona (CDFG 2010a). Liebre Mountain is located approximately 4.5 miles south and east of Alternative 1, Necktie Basin is located approximately four miles north of the new circuit area, and Sierra Pelona is located approximately 2.5 miles north of Alternative 3.

TABLE 7. REPORTED DEER KILL RECORDS FOR ZONE D-11

YEAR	TOTAL REPORTED DEER KILL	TOTAL REPORTED DEER KILL ON PUBLIC LANDS
1999	161	140
2000	234	203
2001	195	169
2002	46	21
2003	151	125
2004	136	112
2005	220	193
2006	230	205
2007	151	137
2008	194	175
2009	117	97

From CDFG Deer Harvest Data, 1999 – 2009. Available in annual reports at http://www.dfg.ca.gov/wildlife/hunting/deer/deerhunt.html
Note: it is difficult to assess the amount of deer kills within the Project area itself, since these records focus on the entire hunt zone and are based only on reported kills.

Currently, mule deer are widespread on the ANF and are assumed to be present wherever openings and cover are interspersed with sources of water. Mule deer range and habitat include coniferous forest, foothill woodland, shrubland, grassland, agricultural fields, and suburban environments. Mule deer prefer a mosaic of vegetation with interspersions of dense shrub or trees among herbaceous and riparian areas. Edge habitat and vegetation ecotones are important components for optimal deer habitat. Dense shrub and trees provide hiding cover from disturbance and predation. Shrub and tree canopies are also utilized for thermal cover during the winter and temperature regulation during summer months.

In order to maintain or improve habitat conditions to sustain healthy deer populations, the national forests are working to retain oak canopy cover in oak/grasslands, close unauthorized roads and control unrestricted vehicle use, restore meadows and riparian areas, and manage chaparral areas near water sources to create irregular shapes to maximize cover and forage opportunities (USFS 2005b, Volume 1, page 124). Fire and fuel management are the main tools intended to implement these objectives, as fires allow for the replenishment and growth of young foraging habitat that is preferred by mule deer (Quinn 1990, USFS 2008). Natural wildfires help to produce early successional forage—ideal for deer—for several years, which will eventually decline in forage quality before burning again. In chaparral habitats, such as that within much of the BRRTP area, mule deer can most easily feed on vegetation that has burned within the last ten years, after which it begins to decline in quality (USFS 2008). However, prescribed burns are influenced by surrounding human activities, as human recreation and development can reduce the extent or remove the possibility of thinning or burning older vegetation, thereby reducing the quality of mule deer habitat in a given area. This has been the case with many forested areas, where absence of fire has resulted in patches of dense trees that reduce the amount of shrubs, herbaceous plants, and even oaks, all of which are used by mule deer as food sources. Oaks in particular are used by mule deer due to their mast, or acorn, production (USFS 2008) as an important food source. As such, mule deer habitat in many areas has declined.

Suitable habitat is composed of four distinctly different elements, the first of which is fawning habitat. Ranges of fawn and doe groups are small, varying from 0.4 to 1.9 miles depending upon water availability and topography. In addition to close proximity to water, fawning areas are characterized by low shrubs or small trees suitable for protection of the doe as she gives birth, and dense shrub thickets for sheltering the fawn. Fawning areas must be interspersed with forage, hiding cover, and thermal cover for the doe. Rutting season occurs in autumn, and one to two fawns are born from early April to midsummer, varying geographically, with peak fawning from late April through mid-June. Mesic areas such as riparian and meadow habitats are sought by mule deer because of their roles as critical fawning areas (Quinn 1990, USFS 2008). These habitats are typically very sensitive to disturbance from recreational use, particularly disturbance within 0.6 mile, which is the typical distance that mule deer prefer to be from a water source (USFS 2008, Aspen 2009). Riparian habitat within the San Gabriel Mountains on federal and non-federal lands has been affected by development and water diversions and extractions over the years, reducing the quantity and quality of this habitat type. As such, impacts to mule deer populations likely have occurred due to reduction in habitat quality and quantity for fawning, water sources, and movement corridors. Demands on water, and thus riparian/meadow habitat, will likely continue to increase with increasing human populations. While official public roads and campgrounds have been closed in some areas on forest lands, which has benefited mule deer due to the reduction in human disturbance, unauthorized roads are still a major problem in some key fawning areas and key winter ranges. Human development in and around the national forests has also continued to affect mule deer abundance and population numbers due to human activities and harassment by domesticated animals, such as dogs.

The remaining elements of suitable mule deer habitat include foraging, cover, and winter range. Foraging habitat includes brush, shrubs, forbs, grasses, and trees where deer feed most actively at dawn and dusk. Hardwoods, such as oaks, are important for mast production, especially in winter range. Hiding and thermal cover is typically close to the ground and thick enough to camouflage the outline of the deer, without being so dense as to obscure the approach of potential predators, such as mountain lions. Thermal cover is similar and generally thought to be denser, with the additional property of sheltering deer from the elements. Winter range tends to be lower elevation habitats that meet the requirements for forage, hiding, and thermal cover described above. Mule deer migrate seasonally between higher elevation summer range and low elevation winter range. Deer migrate downslope in winter to areas with less snow.

The vegetation is highly varied throughout Zone D-11 and includes several desert plant communities, chaparral types, oak woodlands, and riparian series. Because deer will generally respond well to disturbances that enhance brush species that they forage on, riparian areas and areas that have recently burned within the Project area will provide more ideal habitat. Deer are also attracted to acorns, which provide a crucial food source (mast), and patches of oak trees are present within or adjacent to the ROW in several areas, including some instances of scrub oak. However, the proposed BRRTP traverses multiple habitats of which only some, such as those named above, are suitable for actually sustaining mule deer. For instance, portions of the Project area cross areas that have been developed or otherwise degraded by anthropogenic activity, such as the vicinity of Green Valley.

7.1.2 Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis: Availability of suitable vegetation for fawning, forage and cover in close proximity to water is the most limiting factor for mule deer. The Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers all habitat types as potentially suitable for the mule deer. Therefore, the entire Project area is considered suitable habitat and could potentially be impacted by the Project.

Analysis Area for Project-level Effects Analysis: The analysis area for direct, indirect, and cumulative effects of the BRRTP on mule deer varies according to Project components, which overlap and encompass different vegetation areas. Because the Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers all habitat to be suitable for mule deer, all habitat types are taken into account for disturbance estimates. Total acreage of each Project alternative or component on the ANF is presented in Table 8. These calculations are based on the 500-foot wide corridor and include projected habitat disturbance from construction staging areas and access roads.

TABLE 8. TOTAL MULE DEER HABITAT ACREAGE POTENTIALLY IMPACTED BY EACH BRRTP COMPONENT AND PERCENTAGE OF TOTAL HABITAT ON ANF

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2A	ALTERNATIVE 3	RECONDUCTORING	NEW CIRCUIT
Total Acres of Suitable Mule Deer Habitat within the Analysis Area	965.96	787.30	940.11	221.22	787.68	210.24
Percentage of Total Suitable Mule Deer Habitat on ANF (662,983 acres)	0.15%	0.12%	0.14%	0.03%	0.12%	0.03%
Total Acres of Suitable Mule Deer Habitat Impacted within the Analysis Area*	149.98	112.61	132.89	50.66	122.15	41.24
Percentage Impacted of Total Suitable Mule Deer Habitat on ANF (662,983 acres)	0.02%	0.02%	0.02%	0.01%	0.02%	0.01%

*This acreage is calculated based on the maximum temporary and permanent acreages and represents a "worst-case scenario" of disturbance.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The percentage of the total ANF that is within each individual Project component is above in Table 8.

7.1.3 Direct and Indirect Effects to Mule Deer

Mule deer have been observed throughout the forests by biologists. The construction, maintenance and operation of a transmission line would result in both temporary and permanent ground disturbance. Construction of steel lattice towers would create a temporary disturbance that consists of structure work area, pulling and tensioning sites, sleeving and stringing operations, guard structures, material staging sites, and concrete batch plants. Permanent disturbance for steel lattice towers would consist of the structure footprint and foundations, and access roads needed for operations and maintenance activities. The structure footprints would be roughly the same for both flat and mountainous terrain. The logistics of construction in mountainous areas usually requires a greater distance of access roads and would be based on the degree of slope. For transmission line projects, the construction and maintenance of access roads would create the greatest potential for ground disturbing impacts. Within the ANF where the terrain is steep and access is limited, the Forest Service would require that the new double-circuit 230 kV structures be constructed by the use of helicopter. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. The following sites and ground disturbing construction activities would still be required to construct the new transmission line within the identified helicopter construction areas: portable landing pads, helicopter fly yards/staging areas, tower structure vegetation clearing, guard structures at major crossings, wire stringing sites, pullouts, and temporary access roads.

The variance in disturbance between Project components is mainly a result of differences between currently existing road access and the length of the transmission line corridor. Implementing the Project and disturbing patches of vegetation could potentially alter the intensity and frequency of wildfires, which greatly influences foraging habitat by providing early successional forage, which is easy for deer to feed upon. Most of the proposed ROW in the ANF parallels existing transmission lines and would utilize existing access and spur roads.

Disturbance of does and fawns would depend largely on Project timing, route selection, and potential use of helicopter construction. All Project components would cross multiple riparian zones that possess high fawning potential, particularly in areas with numerous oak trees. Construction activities would produce visual activity and noise above 65 decibels (normal human voice is rated at 65 decibels), which could displace deer to adjacent areas outside the area of potential effect. Anthropogenic-generated disturbance has greater potential for adverse effects on non-migratory deer during winter months, when they are more vulnerable to stress-initiated cortisol increases. Due to the large amount of suitable habitat outside the Project area, it is expected that deer would shift to areas away from ongoing Project activities without adverse effect.

New 230 kV Transmission Line

Direct and Indirect Effects

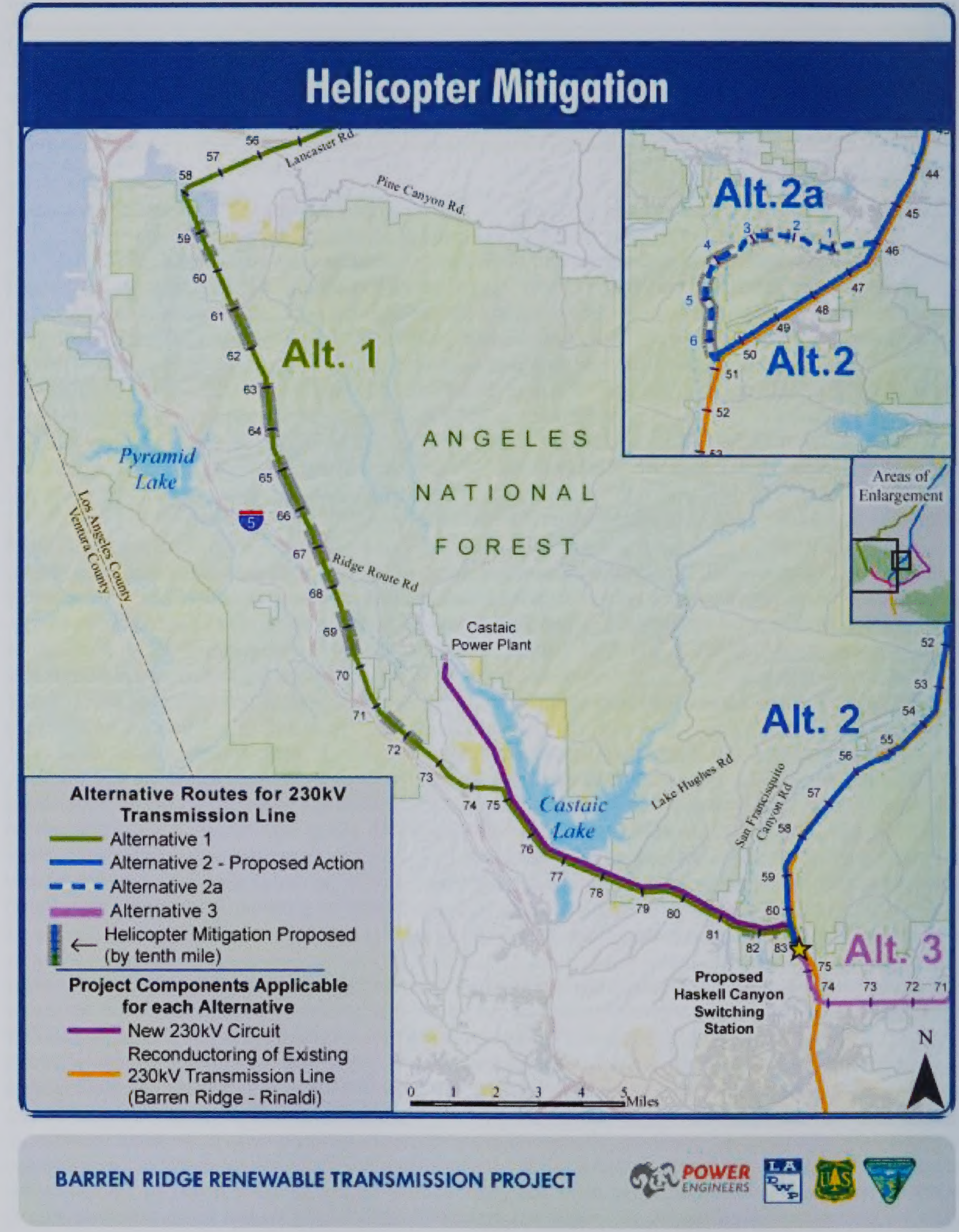
A comparison between alternatives of the number of acres and potential impact for each alternative is shown in Table 8. Existing vegetation would be removed, temporarily impacting habitat until native vegetation is recovered. Areas of permanent disturbance would not be revegetated and would be maintained as part of the transmission line's operation and maintenance activities. A temporary alternative transmission line would be required for construction of Alternative 2 around the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded. This temporary transmission line would be approximately 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in Elizabeth Lake and would constitute 4.18 acres of temporary disturbance. The proposed corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by construction of the transmission line parallel to the roadway.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for deer would decrease. This would be especially true for the acres of riparian habitat to be temporarily impacted (2.8, 6.2, 5.7, and 0.7 acres for Alternatives 1, 2, 2a, and 3, respectively), as riparian areas are particularly important for mule deer and fawning. Riparian habitat may be temporarily impacted until the vegetation has recovered or been restored, or result in the temporary displacement of deer.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that upwards of 100, 50, 78, and 5 RCAs would be affected on Alternatives 1, 2, 2a, and 3, respectively. Some of these were already affected in April 2009 due to unauthorized grading by LADWP in the ROW along Alternatives 2 and 2a, which is addressed further in the Cumulative Effects section. Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the RCAs and availability of surface water for the mule deer. Figure 8, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction in relation to the various Alternatives.

Oak trees along routes used for constructions may require trimming at the time of construction for each Alternative. As a result, a temporary reduction in cover and available mast is expected for each Alternative. However, General Practices (GPs) included in Section 4.4 and the BRRTP DEIS/EIR (USFS, BLM and LADWP 2011) provide for measures that would work to minimize loss of mast-producing coast live oaks. The reduction of trees and browse shrubs from the Project is not expected to limit forage significantly due to the small footprint typical of linear energy transmission projects. In addition, temporary disturbance could result in a short-term improvement in forage quality in decadent brushlands and other late-successional areas, should it allow early successional shrub habitat density to temporarily increase. Mule deer favor areas where trees and other non-shrubs are in lower levels of abundance to allow for denser patches of shrubs. An additional expected benefit of the Project is the improvement of the ratio of vegetative mosaics in dense chaparral cover.

FIGURE 8. IDENTIFIED HELICOPTER MITIGATION LOCATIONS


Helicopter Mitigation
Alt. 1
Alt.2a
Alt.2
Alt. 2
Alt. 3
ANGELES NATIONAL FOREST
Pyramid Lake
Castaic Lake
Castaic Power Plant
Lancaster Rd
Pine Canyon Rd
Ridge Route Rd
Lake Hughes Rd
San Francisquito Canyon Rd
Los Angeles County
Ventura County
5
Areas of Enlargement
Proposed Haskell Canyon Switching Station
Alternative Routes for 230kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
Helicopter Mitigation Proposed (by tenth mile)
Project Components Applicable for each Alternative
New 230kV Circuit
Reconductoring of Existing 230kV Transmission Line (Barren Ridge - Rinaldi)
0 1 2 3 4 5 Miles
N
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

Reconductoring

Direct and Indirect Effects

Suitable habitat for mule deer occurs throughout the entire Project area. Of the estimated 787.7 acres of suitable habitat within the analysis area for the reconductoring, the amount of mule deer habitat that would be affected by reconductoring is 85.8 acres of temporary disturbance and 36.3 acres of permanent disturbance. Temporary disturbance represents 10.9% of the suitable mule deer habitat available within the analysis area for the reconductoring area and 0.01% of the suitable mule deer habitat available on the ANF, while permanent disturbance represents 4.6% of the suitable mule deer habitat available within the analysis area for the reconductoring area and 5.5 x 10^{-3}% of the suitable mule deer habitat available on the ANF. The proposed reconductoring area roughly parallels and is in close proximity to the proposed Alternative 2 alignment throughout the ANF. Therefore, many of the areas that it would affect are similar to the Alternative 2 affected areas. However, because exact disturbance will be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that the reconductoring operation would cause a similar amount of disturbance on average as the construction of the new transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for deer would decrease. This would be especially true for the 9.6 acres of riparian habitat to be temporarily impacted in the reconductoring area (0.03% of the total riparian habitat on the ANF), as riparian areas are particularly important for mule deer and fawning. Should riparian areas be negatively affected by BRRTP, it may reduce their likelihood of being used again in the future until the habitat has been properly restored, or the human disturbance during construction may make deer temporarily wary of the areas.

Habitat values may be decreased if the project activities increase the distribution and abundance of invasive plants. If the Project impacts the hydrology of intermittent streams in areas such as in Dry Canyon or Baird Canyon or even perennial areas such as Drinkwater Flat, where Project vehicles may pass directly through streambeds on access roads or to access tower locations, it could have a more long-term impact on riparian vegetation and availability of surface water. This would also be true for RCAs that may be affected by construction within the reconductoring area. It is anticipated that approximately 50 RCAs would be affected by the reconductoring. Most of the impacted RCAs would be the same as those impacted by Alternative 2, but in the short isolated areas where the two ROWs diverge, there may be a small difference in the number of RCAs affected by construction. RCAs would be affected mainly due to insufficient road width. Some of these were already affected in April 2009 due to unauthorized grading by LADWP, which will be addressed further in the Cumulative Effects section.

Oak trees within the reconductoring area may be trimmed if they overhang within roadbeds, reducing the amount of mast available for fall deer forage. This would be in areas such as Drinkwater Flat, the mouth of South Portal Canyon, and possibly also Bee Canyon, where coast live oak trees are prevalent and could possibly require trimming in order to allow safe passage of construction equipment. A temporary alternative transmission line would be required for construction of Alternative 2 around the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded. This temporary transmission line would be approximately 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in Elizabeth Lake and would constitute 4.18 acres of temporary disturbance. The proposed corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by construction of the transmission line parallel to the roadway. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by reconductoring activities parallel to the roadway. However, GPs included in Section 4.4 and the BRRTP DEIS/EIR (USFS, BLM, and LADWP 2011) provide for measures that would work to minimize loss of mast-producing coast live oaks. The reduction of trees and browse shrubs due to the Project is not expected to limit forage significantly due to the small footprint typical of linear energy transmission projects. In addition, temporary disturbance would likely result in a short-term improvement in forage quality in decadent brushlands and other late-successional areas should it allow early successional shrub habitat density to temporarily increase. Mule deer favor areas where trees and other non-shrubs are in lower levels of abundance to allow for denser patches of shrubs. An additional expected benefit of the Project is the improvement of the ratio of vegetative mosaics in dense chaparral cover.

New 230 kV Circuit

Direct and Indirect Effects

Suitable habitat for mule deer occurs throughout the entire Project area. Of the estimated 210.2 acres of suitable habitat within the analysis area for the new circuit, the amount of mule deer habitat that would be affected by the new circuit is 30.7 acres of temporary disturbance and 10.6 acres of permanent disturbance. Temporary disturbance represents 14.6% of the total suitable mule deer habitat available within the analysis area for the new circuit and 4.6 x 10^{-3}% of the total suitable mule deer habitat available on the ANF, while permanent disturbance represents 5.0% of the total suitable mule deer habitat available within the analysis area for the new circuit and 1.6 x 10^{-3}% of the total suitable mule deer habitat available on the ANF. A total of 1.7 acres of riparian habitat is expected to be temporarily impacted in the new circuit area (0.01% of the total riparian habitat on the ANF). The forested portion and much of the non-forested portion of the new circuit parallels Alternative 1. Therefore, many of the areas that it would affect within the ANF would be similar to the Alternative 1 affected areas. However, because exact disturbance will be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that installation of the new circuit would cause a similar amount of disturbance on average as the construction of the new Alternative 1 transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

If the Project impacts the hydrology of intermittent streams in areas such as Charlie Canyon, where Project vehicles may pass directly through the streambed to access tower locations, it could have a more long-term impact on riparian vegetation and availability of surface water. This would also be true for RCAs that may be affected by construction on the new circuit. It is expected that one RCA on the ANF may be affected by construction. There are numerous other streambed crossings outside of the forest, such as in Charlie Canyon, but these are not within the ANF. There are patchy areas of oak trees in Charlie Canyon near the ROW that may require trimming at the time of construction if vehicles or equipment cannot pass without risking breaking branches. Acorns dropped by oaks provide food for mule deer and a reduction in the limbs or cover provided by oak trees may result in a similar reduction in available mast. Substantial removal of oak trees or habitat could result in decreased forage for mule deer.

Cumulative Effects

The biggest impacts to deer from past, present, and reasonable foreseeable future actions would likely be from an increase in disturbance by humans and permanent loss of foraging habitat. Because of the linear nature of transmission lines, permanent loss of forage is expected to be minimal and generally confined to areas where towers or access roads are placed, and even beneficial where temporary disturbance removes grasses or other competitors with the shrubs that deer favor, potentially increasing forage quality. Recent fires may increase forage quality for deer by diversifying the vegetation as the habitat recovers (Geomac 2010). Deer populations are typically reduced during the first year after chaparral burns due to the decrease in available forage and cover, but will increase again during the second and third years as succulent forage grows (Biswell 1961 and Taber and Dasman 1958 cited in Quinn 1990). This effect is typically confined to young chaparral growing within a 90-meter radius of the cover of older, unburned chaparral.

Non-native plant removal and fuel management activities are planned throughout the Forest. These include thinning, pruning, chipping, or burning vegetation surrounding plantations to create fuelbreaks, primarily of surrounding trees (USFS 2009 – 2010, USFS 2011). Fuel reduction projects are likely to temporarily reduce mule deer habitat and cause temporarily displacement. However, these impacts are short-term, and the impacts are intended to offset the potential for severe, stand-replacing or type-converting wildfires.

SCE's ATP may cause a cumulative effect to mule deer along with BRRTP. Due to the similar nature of these projects, each is expected to have similar impacts to mule deer. The ATP's construction was expected to result in the temporary abandonment of deer territories due to noise, increased human activity, and helicopter activity (Aspen 2006). These effects were only expected to be extended for the construction phase of the project. ATP construction was completed in October 2009 and the transmission line is energized. Construction on the BRRTP is not anticipated to begin until 2013, providing at least four years of time for individual deer to return to their territories or find new territories as necessary. Due to the localized nature of construction (i.e., construct at one site and then move to the next), it is likely that the deer were not displaced for long amounts of time. Mule deer are again likely to be displaced by BRRTP's construction based on known habitat and field observations of mule deer, but again would only be expected to be displaced for a relatively short period of time while each tower site or construction area is completed. In some cases there may be larger areas of permanent displacement, such as the Haskell Canyon Switching Station. In areas of temporary disturbance, it would be expected that mule deer would be likely to return, as they prefer young chaparral and ecotones (Quinn 1990).

Additionally, SCE's TRTP will be partially built within the ANF and is expected to have an effect on mule deer. SCE estimates that 272 acres of mule deer habitat would be impacted by the construction of Alternative 2, comprising 0.04% of the total mule deer habitat on the ANF, and that 203 acres of habitat would be impacted by the construction of Alternative 6, comprising 0.03% of the total mule deer habitat on the ANF (Aspen 2009). These types of disturbances consist of but are not limited to tower construction; wire stringing; construction, maintenance, or improvement of access roads; and use of staging areas, landing pads, and support yards. The habitat loss associated with the TRTP may result in a cumulative loss of mule deer habitat with the BRRTP. Construction on TRTP began in spring 2010 and is expected to be completed in 2015. Because of this it is possible that construction of both projects on the ANF may occur concurrently and that mule deer in both project areas may be affected simultaneously. While these projects would be within different areas of the ANF (TRTP is located in the southern half of the ANF, while BRRTP would be located in the northern half), they may have regional effects on the species as individuals move to new areas due to habitat loss and/or construction disturbance.

In April 2009, LADWP conducted unauthorized road grading along approximately five miles of City Highline Motorway Fire Road, a road that would provide partial access to Alternatives 2 and 2a, as well as the reconductoring corridor. This grading resulted in sediment in many RCAs and the trimming of numerous coast live oak trees, primarily in the Drinkwater Flat area, which may have a small and localized effect on the amount of available mast for mule deer to browse in this area. Any additional oak trimming that is necessary for construction passage during BRRTP would have a cumulative effect on the local quantity of forage (i.e., mule deer habitat) in this area.

7.1.4 Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest Service FEIS (USFS 2005b, Volume 2, page 77) identifies both habitat and population monitoring as acceptable methodologies. The sections below summarize the habitat and population status and trend data for the mule deer. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USFS 2008), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Not utilized as the primary monitoring tool for mule deer on the ANF.

- *Population Status and Trend at the Forest Scale*
  Population monitoring data collected by CDFG since 1998 indicates the deer population in Zone D-11 is considered stable to slightly declining, yet considerably below levels seen in the late 1960s and 1970s. As with most deer herds in California and other western states, the long-term population trend has been on a steady decline since the 1960s and 1970s. Detailed information on these population data is presented in the ANF MIS Report (USFS 2008).

7.1.5 Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Mule deer are found throughout the ANF (662,983 acres). Areas impacted by Project activities would not initially provide suitable habitat for mule deer. However, with successful implementation of restoration efforts, most of the Project area would be expected to provide suitable mule deer habitat in the future (more than five years). The Project-level habitat impacts would not alter or contribute to the existing forest-wide population trends for the mule deer.

7.2 MOUNTAIN LION (*PUMA CONCOLOR*)

7.2.1 Habitat/Species Relationship

The mountain lion was selected as an MIS to detect the effects of National Forest activities and uses on landscape-level habitat fragmentation and habitat linkages. A key factor determining the long-term strength of mountain lion populations in Southern California national forests is habitat fragmentation between mountains and open space on private lands (Dickson et al. 2005, USFS 2005b, Volume 1, page 126). They are associated with all habitat types and are affected by changes in landscape linkages and habitat fragmentation. According to the Forest Service FEIS (USFS 2005b, Volume 2, page 77), the objective for mountain lion on the ANF is to have well-distributed populations and functional landscape linkages. Due to California State law, mountain lions are only managed by CDFG if they are a nuisance animal or if a public threat occurs.

Mountain lions have large home ranges and require extensive areas of riparian vegetation and brushy stages of various habitats, with interspersions of irregular terrain, rocky outcrops, and tree/brush edges. Fragmentation of habitats by spread of human developments and associated roads, power transmission corridors, and other support facilities restricts movements and increases association with humans. These changes are detrimental to mountain lion populations (CDFG 2005). Mountain lion population counts are very difficult and expensive, and do not exist for the Project area. The CDFG estimates the mountain lion population statewide to be between 4,000 and 6,000 (CDFG 2007). They estimated the population to be 5,100 adults during the 1970s and 1980s. Based on records of depredation, attacks on people, and predation on prey populations, it is suspected that the population peaked in 1996, and has been somewhat stable for the past several years (CDFG 2007). Mountain lion encounters and sightings have been increasing, which may be due to a loss of habitat, expansion of urban development, shifting prey base, or dispersal of young outside of existing occupied areas (USFS 2008). The mountain lion is the largest carnivore in Southern California and requires large core habitat areas, abundant prey, and habitat connectivity between sub-populations. Mountain lion studies over the last 30 years have estimated population densities for different habitat types around the State. These density estimates varied from zero to ten lions per 100 square miles (CDFG 2007).

Mountain lion are widespread on the forest and are assumed to be present in all habitat types wherever deer, which represent approximately 60-80% of mountain lion diet, occur (CDFG 2005). The amount of suitable habitat for mountain lions on the ANF is estimated at 662,983 acres (USFS 2008). Mountain lions can survive in a variety of habitats, including deserts, Coast Ranges, and many types of covered habitats, especially those with streams (USFS 2008). More than half of California is prime mountain lion habitat. They prefer to reside, however, in areas where deer are most prevalent, such as forest and shrubland habitats (USFS 2008, Quinn 1990, CDFG 2005). Foothills and mountains are the most suitable mountain lion habitat, while valleys and deserts are considered unsuitable. Dickson et al. (2005) found that areas with riparian vegetation were used most frequently during a four-year study in the Santa Ana Mountains, while grassland, woodland, or urbanized areas were used least frequently.

Mountain lions require large patches of relatively undisturbed habitat and uninhibited connectivity between subpopulations (Penrod et al. 2004). While this is ideal, Dickson et al. (2005) found that mountain lions may travel more efficiently along dirt roads, and tend to avoid two-lane paved roads. Therefore it is important that mountain lions have dispersal and transportation corridors between the San Gabriel Mountains and the San Bernardino Mountains, as a reduction in habitat or availability of movement corridors within occupied habitat may be detrimental to the species. This movement corridor is currently threatened by the presence of the I-15 freeway, State Highway 138, and three railroad tracks, which severely impact the ability of mountain lions to move throughout their home ranges (USFS 2008). However, the ANF has some large areas of non-fragmented habitat ideal for supporting mountain lion populations, and currently there is no information that would lead to concern for mountain lion populations on the ANF. Alternative 2, the reconductoring area, and the new circuit area all possess mixtures of paved and unpaved access roads.

According to the Forest Service FEIS (2005b, Volume 1, page 126), activities that sustain healthy mountain lion populations are related to activities that support healthy deer populations and provide travel routes for mountain lions to disperse to other suitable habitats. Like mule deer, mountain lions prefer solitary areas, so disturbances to riparian areas or deer habitat will also affect mountain lions (USFS 2005b, Volume 1, page 126). Vehicle access in mountain lion habitat raises the potential for disturbance, harassment, or mortality to mountain lions that may be present, and the addition of new roads can cause fragmentation in habitat, creating barriers that reduce mountain lion movement corridors. Also, as with mule deer, mountain lions are dependent on wildfire frequency, as fires will reduce canopy closure, increase plant vigor and accessibility, and improve shrub palatability, leading to a local increase in deer and indirectly benefiting mountain lions (USFS 2008).

It is unknown how the above population and density estimates relate to mountain lion numbers and trends on the ANF. Some habitat within the Project areas is not ideal for mountain lions, in that the habitat is not ideal for mule deer, its primary prey. However, at least one mountain lion was recently spotted in 2009 within the BRRTP area in Drinkwater Flat, indicating that mountain lions, while not necessarily common, are present within the Project area.

7.2.2 Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis: Availability of adequate prey base and habitat connectivity between sub-populations are the most limiting factors for mountain lions. The Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers all habitat types as potentially suitable for the mountain lion. Therefore, the entire Project area is considered suitable habitat and could potentially be impacted by the Project.

Analysis Area for Project-level Effects Analysis: The analysis area for direct, indirect, and cumulative effects of the BRRTP on mountain lions varies according to Project components, which overlap and encompass different vegetation areas. Because the Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers all habitat to be suitable for mountain lions, all habitat types are taken into account for disturbance estimates. Total acreage of each Project alternative or component on the ANF is presented in Table 9. These calculations are based on the 500-foot wide corridor and include projected habitat disturbance from construction staging areas and access roads.

TABLE 9. TOTAL MOUNTAIN LION HABITAT ACREAGE WITHIN THE ANALYSIS AREA FOR EACH BRRTP COMPONENT ON ANF AND THE PERCENTAGE OF TOTAL MOUNTAIN LION HABITAT ON THE ANF

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2A	ALTERNATIVE 3	RECONDUCTORING	NEW CIRCUIT
Total Acres of Suitable Mountain Lion Habitat within the Analysis Area	965.96	787.30	940.11	221.22	787.68	210.24
Percentage of Total Suitable Mountain Lion Habitat on ANF (662,983 acres)	0.15%	0.12%	0.14%	0.03%	0.12%	0.03%
Total Acres of Suitable Mountain Lion Habitat Impacted within the Analysis Area*	149.98	112.61	132.89	50.66	122.15	41.24
Percentage Impacted of Total Suitable Mountain Lion Habitat on ANF (662,983 acres)	0.02%	0.02%	0.02%	0.01%	0.02%	0.01%

*This acreage is calculated based on the maximum temporary and permanent acreages and represents a "worst-case scenario" of disturbance.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The percentage of the total ANF that is within each individual Project component is above in Table 9.

7.2.3 Direct and Indirect Effects to Mountain Lion

A mountain lion was observed by POWER Engineers, Inc. (POWER) biologists in 2009 in Drinkwater Flat, an area that is common to Alternatives 2 and 2a, as well as the reconductoring corridor. The Project is expected to have little direct effect on mountain lions. Activities may temporarily displace or disturb individuals, but this is expected to be an uncommon occurrence due to the large home ranges utilized by mountain lions, which in turn results in a typically low population density. However, noise and activity associated with helicopter construction may disturb mountain lions in the Project area and cause temporary changes in mountain lion occurrences and distribution. Population densities have been estimated based on studies over the last 30 years to be somewhere between zero and ten mountain lions per 100 square miles (CDFG 2007). A female with young could potentially occur within or near the Project area. Females with young usually remain within a defined area near a cave or other natural cavity, but Project activity is not expected to cause mortality. Mountain lions prefer vegetated ridgetops and riparian areas for traveling and hunting (USFS 2008); the Alternative 2 and 2a access road and transmission line through Drinkwater Flat would be adjacent to a perennial streambed, where a mountain lion was detected in 2009. Female home ranges in Southern California were measured to be an average of 93 km^2, while male ranges were measured at approximately 363 km^2 (USFS 2008). Increased vehicle activity may increase the chance for a collision and/or illegal poaching, resulting in injury or mortality, but this is expected to be a rare occurrence.

The indirect effects of the Project would likely be to slightly improve the quality of mule deer habitat by creating new edge habitat and removing vegetation during construction that could potentially grow back and provide new mast and food for deer, which prefer young chaparral or ecotones (Quinn 1990). This may temporarily result in the loss of habitat for both mountain lions and their prey, such as mule deer, but as vegetation grows back it may be more attractive to mule deer, indirectly benefiting mountain lions. This edge habitat would be created along additional access roads or areas that are to be graded for permanent habitat removal, such as tower pads. Studies have shown that mountain lions prefer edge habitat, as this is where deer tend to gather and where convenient cover can be found for hiding (Quinn 1990). Alternatively, the Project vegetation treatments may reduce the density of hiding cover for these animals, but the linear nature of the Project footprint is not expected to increase habitat fragmentation. Mountains lions are active day or night, but tend to be most active during nocturnal hours in areas frequented by humans (Reid 2006). As such, they are less likely to be disturbed during diurnal vegetation removal and construction, although they could still be present.

New 230 kV Transmission Line

Direct and Indirect Effects

A comparison between alternatives of the number of acres and potential impact for each alternative is shown in Table 9. Existing vegetation would be removed, temporarily impacting habitat until native vegetation is recovered. Areas of permanent disturbance would not be revegetated and would be maintained as part of the transmission line's operation and maintenance activities. A temporary alternative transmission line would be required for construction of Alternative 2 around the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded. This temporary transmission line would be approximately 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in Elizabeth Lake and would constitute 4.18 acres of temporary disturbance. The proposed corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by construction of the transmission line parallel to the roadway.

Post-Project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for the mule deer, the mountain lion's preferred prey base, would decrease. This would be especially true for the acres of riparian habitat to be temporarily impacted (2.8, 6.2, 5.7, and 0.7 acres for Alternatives 1, 2, 2a, and 3, respectively), as riparian areas are particularly important for mule deer and fawning. The improvement of habitat conditions for deer would benefit mountain lions by providing additional hunting opportunities.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that upwards of 100, 50, 78, and 5 RCAs would be affected on Alternatives 1, 2, 2a, and 3, respectively. Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the RCAs and availability of surface water for the mule deer. Figure 8, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction in relation to the various alternatives. Noise and activity associated with the helicopter construction may disturb mountain lions in the Project area and cause changes in occurrences and distribution. Dispersal- or noise-induced stress may lower animals' fitness and temporarily reduce their abilities to mate and raise young or efficiently forage.

However, helicopter construction would also have some beneficial effects. It would reduce the amount of road access required by the Project, possibly decreasing the amount of road widening and subsequent disturbance to surrounding vegetation and riparian conservation areas. The average maximum permanent disturbance acreages per mile with conventional construction are 2.4 acres for existing roads to be widened, 4.8 acres for new flat roads, 7.7 acres for new sloping roads, 11.6 acres for new steep roads, and 15.5 acres for new very steep roads. In contrast, the average maximum permanent disturbance per mile for helicopter construction is 0.8 acre.

Oak trees along routes used for constructions may require trimming at the time of construction for each alternative. Trimming was already conducted in 2009 by LADWP, as addressed in the Cumulative Effects section. As a result, a temporary reduction in cover and available mast is expected for each Alternative.

However, General Practices (GPs) included in Section 4.4 and the BRRTP Draft EIS/EIR (USFS, BLM and LADWP 2011) provide for measures that would work to minimize loss of mast-producing coast live oaks. The reduction of trees and browse shrubs from the Project is not expected to limit forage significantly due to the small footprint typical of linear energy transmission projects. In addition, temporary disturbance could result in a short-term improvement in forage quality in decadent brushlands and other late-successional areas, should it allow early successional shrub habitat density to temporarily increase. Mule deer favor areas where trees and other non-shrubs are in lower levels of abundance to allow for denser patches of shrubs. This would in turn benefit mountain lions and their hunting opportunities. An additional expected benefit of the Project is the improvement of the ratio of vegetative mosaics in dense chaparral cover.

Reconductoring

Direct and Indirect Effects

Suitable habitat for mountain lion occurs throughout the Project area. Since the Project area is expected to provide suitable habitat for mule deer, corresponding mountain lion use is also expected. Of the estimated 787.7 acres of suitable habitat within the analysis area for the reconductoring, the amount of mountain lion habitat that would be affected by the reconductoring is 85.8 acres of temporary disturbance and 36.3 acres of permanent disturbance. Temporary disturbance represents 10.9% of the total suitable mountain lion habitat available within the analysis area for the reconductoring and 0.01% of the total suitable mountain lion habitat available on the ANF, while permanent disturbance represents 4.61% of the total suitable mountain lion habitat available within the analysis area for the reconductoring and 5.5 x 10^{-3}% of the total suitable mountain lion habitat available on the ANF. The reconductoring would roughly parallel and be in close proximity to Alternative 2 throughout the ANF. Therefore, many of the areas that it would affect are similar to the Alternative 2 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that the reconductoring operation would cause a similar amount of disturbance on average as the construction of the new transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for the mule deer, the mountain lion's preferred prey base, would decrease. This would be especially true for the 9.6 forested acres of riparian habitat to be temporarily impacted in the reconductoring area (0.03% of the total riparian habitat on the ANF), as riparian areas are particularly important for mule deer and fawning. Improved habitat conditions for deer would benefit mountain lions by providing additional hunting opportunities.

Habitat values may be decreased if Project activities increase the distribution and abundance of invasive plants. If the Project impacts the hydrology of intermittent streams in areas such as in Dry Canyon or Baird Canyon or even perennial areas such as Drinkwater Flat, where Project vehicles may pass directly through streambeds on access roads or to access tower locations, it could have a more long-term impact on riparian vegetation and availability of surface water. This would also be true for RCAs that may be affected by construction within the reconductoring area. It is anticipated that approximately 50 RCAs would be affected by the reconductoring. Most of the impacted RCAs would be the same as those impacted by Alternative 2, but in the short isolated areas where the two ROWs diverge, there may be a small difference in the number of RCAs affected by construction. RCAs would be affected mainly due to insufficient road width.

Oak trees within the reconductoring area may be trimmed if they overhang within roadbeds, reducing the amount of mast available for fall deer forage and making mule deer, the mountain lion's primary prey, less likely to spend extensive time in these areas. This would be in areas such as Drinkwater Flat (where oak trees were already trimmed by LADWP in 2009, addressed further in the Cumulative Effects section), the mouth of South Portal Canyon, and possibly also Bee Canyon, where coast live oak trees are prevalent and could possibly require trimming in order to allow safe passage of construction equipment. A temporary alternative transmission line would be required for construction of Alternative 2 around the Green Valley area to maintain power while the permanent structures are being upgraded. This temporary transmission line would be approximately 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in Elizabeth Lake and would constitute 4.18 acres of temporary disturbance. The proposed corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by reconductoring activity parallel to the roadway. However, GPs included in Section 4.4 and the BRRTP DEIS/EIR (USFS, BLM and LADWP 2011) provide for measures that would work to minimize loss of mast-producing coast live oaks. The reduction of trees and browse shrubs from the Project is not expected to limit forage significantly due to the small footprint typical of linear energy transmission projects. In addition, temporary disturbance would likely result in a short-term improvement in forage quality in decadent brushlands and other late-successional areas. This would in turn benefit mountain lions and their hunting opportunities. An additional expected benefit of the Project is the improvement of the ratio of vegetative mosaics in dense chaparral cover.

New 230 kV Circuit

Direct and Indirect Effects

Suitable habitat for mountain lion occurs throughout the Project area. Since the Project area is expected to provide suitable habitat for mule deer, corresponding mountain lion use is also expected. Of the estimated 210.2 acres of suitable habitat within the analysis area for the new circuit, the amount of mountain lion habitat that would be affected by the new circuit is 30.7 acres of temporary disturbance and 10.6 acres of permanent disturbance. Temporary disturbance represents 14.58% of the total suitable mountain lion habitat available within the analysis area for the new circuit and approximately $4.6 \times 10^{-3}\%$ of the total suitable mountain lion habitat available on the ANF, while permanent disturbance represents 5.0% of the total suitable mountain lion habitat available within the analysis area for the new circuit and $1.6 \times 10^{-3}\%$ of the total suitable mountain lion habitat available on the ANF. A total of 1.7 acres of riparian habitat are expected to be temporarily impacted in the new circuit area (0.01% of the total riparian habitat on the ANF). The forested portion and much of the non-forested portion of the new circuit would parallel Alternative 1. Therefore, many of the areas that it would affect within the ANF are similar to the Alternative 1 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that installation of the new circuit would cause a similar amount of disturbance on average as the construction of the new Alternative 1 transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

If the Project impacts the hydrology of intermittent streams in areas such as in Charlie Canyon, where Project vehicles may pass directly through the streambed on access roads or to access tower locations, it could have a more long-term impact on riparian vegetation and availability of surface water. This would also be true for RCAs that may be affected by installation of the new circuit. It is expected that one RCA on the ANF may be affected by construction. There are numerous other streambed crossings outside of the forest, such as in Charlie Canyon, but these are not within the ANF. There are patchy areas of oak trees in Charlie Canyon near the ROW that may require trimming at the time of construction if vehicles or equipment cannot pass without risking breaking branches. Acorns dropped by oaks provide food for mule deer and a reduction in the limbs or cover provided by oak trees may result in a similar reduction in available mast. Substantial removal of oak trees or habitat could result in decreased forage for mule deer, which may affect the likelihood of mountain lions to hunt in the area if mule deer are not present or are not utilizing the area.

Cumulative Effects

Because of their large home ranges, there are no past or future activities anticipated that would have significant cumulative effects on mountain lions or their habitat within the forest. Influences to prey, such as hunting or diseases that affect mule deer population numbers, would probably have more effect on mountain lion numbers. Projects that are deemed to have cumulative effects on mule deer would likely have some effect on mountain lions, as well, on a local level.

An area of concern has been the continued decline in permeability of the critical landscape linkages from the San Gabriel Mountains to the other adjacent mountain ranges that support mountain lions. Increased widening of the existing highway system and new highways or railways, both within and outside the National Forest, can create barriers to movement.

SCE's ATP may cause a cumulative effect to mountain lions along with BRRTP. The ATP's construction was expected to result in the temporary abandonment of mountain lion territories due to noise, increased human activity, and helicopter activity (Aspen 2006). These activities may stress mountain lions not only because of deer abandoning the area, but because the activities may scare away the mountain lions as well. These effects were only expected to be extended for the construction phase of the project, with mountain lions assuming their prior population levels following site restoration. ATP construction was completed in October 2009 and the transmission line is energized. Construction on the BRRTP is not anticipated to begin until 2013, providing at least four years of time for mountain lions to adjust their hunting behavior to deer movements and to return to their previous areas as construction sites are restored. While the ATP corridor does not overlap with the BRRTP, BRRTP's Alternatives 2, 2a, and the reconductoring corridor all run relatively close to the ATP project area. Mountain lions are again likely to be displaced by BRRTP's construction based on known habitat, but again would only be expected to be displaced for a relatively short period of time while each tower site or construction area is completed and to respond favorably to site restoration. In some cases, there may be larger areas of permanent displacement, such as at the Haskell Canyon Switching Station site. It is expected that, if mule deer are able to reestablish in their previous areas or disperse into new areas following construction, mountain lions will likely do the same.

Additionally, SCE's TRTP will be partially built within the ANF and is expected to have an effect on mountain lions. SCE estimates that 272 acres of mountain lion habitat would be impacted by the construction of Alternative 2, comprising 0.04% of the total mountain lion habitat on the ANF, and that 203 acres of habitat would be impacted by the construction of Alternative 6, comprising 0.03% of the total mountain lion habitat on the ANF (Aspen 2009). These types of disturbances consist of but are not limited to tower construction; wire stringing; construction, maintenance, or improvement of access roads; and use of staging areas, landing pads, and support yards. The habitat loss associated with the TRTP may result in a cumulative loss of mountain lion habitat with the BRRTP. Construction on TRTP began in spring 2010 and is expected to be completed in 2015. Because of this, it is possible that construction of both projects on the ANF may occur concurrently and that mountain lions in both project areas may be affected simultaneously. While these projects would be within different areas of the ANF (TRTP is located in the southern half of the ANF, while BRRTP would be located in the northern half), they may have regional effects on the species as individuals move to new areas due to habitat loss and/or construction disturbance. It is not expected that mountain lions from one half of the forest would be pushed into the other half during construction and, following restoration, mountain lions may move back into their prior ranges.

In April 2009, LADWP conducted unauthorized road grading along approximately five miles of City Highline Motorway Fire Road, a road that would provide partial access to Alternatives 2 and 2a, as well as the reconductoring corridor. This grading resulted in sediment in many RCAs and the trimming of numerous coast live oak trees, primarily in the Drinkwater Flat area, which may have a small and localized effect on the amount of available mast for mule deer to browse in this area. Any additional oak trimming that is necessary for construction passage during BRRTP would have a cumulative effect on the local quantity of forage (i.e., mule deer habitat) in this area. This could in turn affect the prevalence of mountain lions in this area, where a mountain lion was previously observed in 2009 by POWER biologists.

7.2.4 Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest Service FEIS (USFS 2005b, Volume 2, page 77) identifies studies in cooperation with CDFG and USGS. Trends would be measured in distribution movement and/or habitat conditions. The sections below summarize the habitat and population status and trend data for the mountain lion. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USFS 2008), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Not utilized as the primary monitoring tool for mountain lion on the ANF.

- *Population Status and Trend at the Forest Scale*
  CDFG is responsible for management of mountain lion populations. Based on records of depredation, attacks on people, and predation on prey populations, it is suspected that the statewide population peaked in 1996, and has been somewhat stable for the past several years (CDFG 2007). The following statistics from the CDFG website summarize depredation permits issued by county (CDFG 2010b, CDFG 2010c). Between 2000 and 2009, there were only ten depredation permits issued for mountain lions within Los Angeles County, four of which were killed. From 1990 to 1999, six mountain lions were depredated under the 18 depredation permits issued in Los Angeles County. When hunting for mountain lion was legal in California, three depredation permits were issued from 1980 to 1989 and zero mountain lions were taken. Only one depredation permit was issued from 1972 to 1979, which did not have a corresponding kill.

  CDFG has described the mountain lion population in California as stable. Further estimates are zero to ten mountain lions per 100 square miles based on available habitat within the state (CDFG 2007). The ANF has some large areas of unfragmented habitat ideal for supporting mountain lion populations. Thus, mountain lion populations within the San Gabriel Mountains are considered stable. Detailed information on these population data is presented in the ANF MIS Report (USFS 2008).

7.2.5 Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Mountain lion are found throughout the ANF (662,983 acres). Areas impacted by Project activities would not initially provide suitable habitat for mountain lion or their preferred prey base, mule deer. However, with successful implementation of restoration efforts, the Project area would be expected to provide suitable mountain lion habitat in the future (more than five years). The Project would not eliminate corridor linkages for mountain lion within the ANF. The Project-level habitat impacts would not alter or contribute to the existing forest-wide population trends for the mountain lion.

7.3 ARROYO TOAD (*ANAXYRUS CALIFORNICUS*)

7.3.1 Habitat/Species Relationship

The arroyo toad was selected as an MIS to indicate health of low-elevation riparian and aquatic ecosystems. Trends in populations, stream occupancy, and habitat condition are used as indicators of the effectiveness of management actions in conserving these ecosystems. Short-term fluctuations in arroyo toad populations may not clearly indicate the effects of management actions because of the strong correlation between weather patterns and toad populations. However, long-term trends in arroyo toad populations and habitat should reflect whether management activities and strategies have been successful in improving habitat conditions for toads and other aquatic and riparian-dependent species that are susceptible to high levels of human disturbance. The habitat condition desired by the ANF LMP is that flow regimes in streams that provide appropriate habitat for the arroyo toad be sufficient to allow the species to remain extant and individuals to complete its life cycles (USFS 2008).

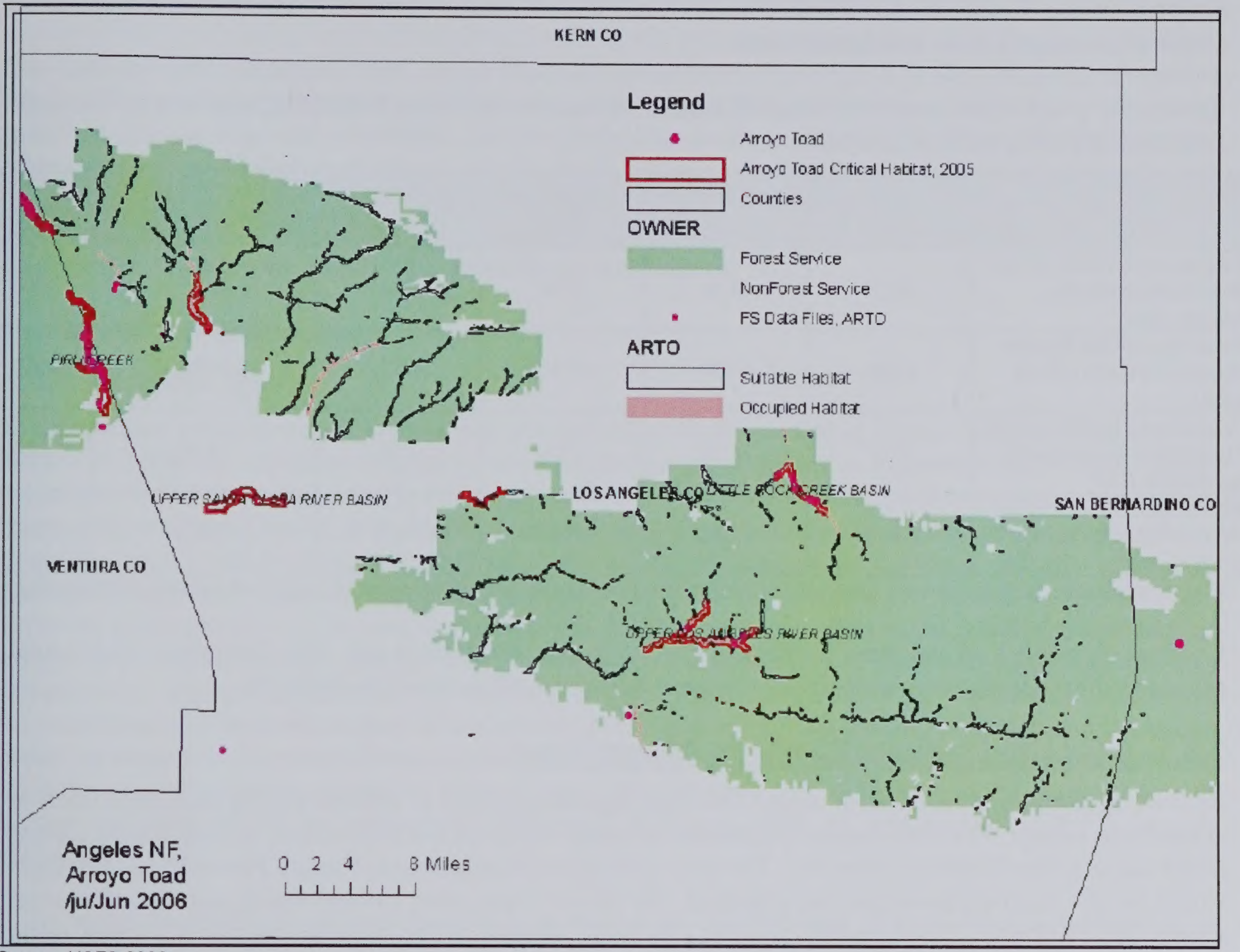
Arroyo toads are known from Monterey County south to Baja California, and have extremely specialized habitat requirements (CDFG 2005). They are restricted to either perennial or intermittent streams and rivers with shallow, gravelly pools adjacent to sandy slopes (USFS 2008, SCE and GANDA 2006), with scattered surrounding vegetation consisting of mulefat, willows, cottonwoods, and/or sycamores or coast live oaks (Stebbins 2003, InfoNatura 2007). The streams should be slow-moving and preferably naturally disturbed on a regular basis, such as by flooding (USFWS 2000). Foraging is often conducted around the driplines of oak trees, focusing predominantly on ant trails (USFS 2008).

Several factors have resulted in the decline of arroyo toads within their range, which is currently estimated to be approximately 25% of their historic range (USFWS 2009). Water availability is a concern for populations that are present just downstream of major dams or near wells that may draw down surface water (USFS 2008, Stephenson and Calcarone 1999). Non-native wildlife species, such as bullfrogs, green sunfish, largemouth bass, or crayfish, have been known to eat arroyo toads of all age classes from larvae to adult (USFS 2008). Non-native plant species, such as tamarisk (*Tamarix* spp.) and giant reed (*Arundo donax*), can form dense stands relatively quickly and, in addition to stabilizing stream terraces, have higher evapo-transpiration rates than native vegetation, decreasing water availability (Stephenson and Calcarone 1999). Campgrounds, roads, trails, off-highway vehicle use, and livestock grazing near arroyo toad breeding pools can result in egg strands being crushed or disturbed (USFS 2008). All of these factors can and have resulted in a decline to arroyo toad populations in California.

As of 2009, there are 23 known arroyo toad populations in California, including populations within all four Southern California National Forests, where approximately 36% of the total population resides (USFWS 2009). In the ANF, there are three known active populations encompassing an estimated 4,000 acres of occupied habitat (USFWS 2009). Arroyo toads occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill and Alder Creeks; and on the desert side of the San Gabriel Mountains along Little Rock Creek (USFS 2008). A fourth population has historically been known to occur along Arroyo Seco, but it is believed that this population has since been extirpated (USFWS 2009).

Of these three remaining populations, only Castaic Creek is located in proximity to the Project area. The Castaic Creek area was extended in February 2011 as arroyo toad critical habitat (76 FR 7245 7467). Focused surveys for the BRRTP conducted in 2008 and 2009 determined that suitable habitat exists in various areas along San Francisquito Canyon, Dry Canyon, and Haskell Canyon. However, arroyo toads were not detected at these locations and are only known to be present in Castaic Creek in the Project's vicinity. No current arroyo toad population counts for ANF are available, although known occurrences can be seen in Figure 9, a diagram made by the Forest Service of known arroyo toad habitat and occurrences (USFS 2008).

FIGURE 9. ARROYO TOAD FOREST SERVICE DATA POINTS, SUITABLE HABITAT, AND OCCUPIED HABITAT


KERN CO
Legend
● Arroyo Toad
Arroyo Toad Critical Habitat, 2005
Counties
OWNER
Forest Service
NonForest Service
● FS Data Files, ARTO
ARTO
Suitable Habitat
Occupied Habitat
PIRU CREEK
UPPER SANTA CLARA RIVER BASIN
LOS ANGELES CO
LITTLE ROCK CREEK BASIN
SAN BERNARDINO CO
VENTURA CO
UPPER LOS ANGELES RIVER BASIN
Angeles NF,
Arroyo Toad
Jul/Jun 2006
0 2 4 8 Miles

Source: USFS 2008.

Suitable arroyo toad habitat is uncommon within the BRRTP area, and is found more commonly in adjacent areas or in other ANF ranger districts. Areas of suitable habitat may be found in Castaic Creek immediately north of the termination of the proposed new circuit, and in Dry Creek and portions of San Francisquito Creek near Alternatives 2 and 2a. All of these areas include streambeds with a gravel/sandy substrate.

7.3.2 Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis: According to the Forest Service FEIS (USFS 2005b, Volume 2, page 77), sustained quality and quantity of suitable riparian and aquatic habitat types are key to the health of arroyo toad populations. Therefore, riparian habitat within the Project area is considered potentially suitable habitat that could be potentially impacted by the Project.

Analysis Area for Project-level Effects Analysis: The analysis area for direct, indirect, and cumulative effects of the BRRTP on arroyo toads varies according to Project components, which overlap and encompass different vegetation areas. Because the Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers aquatic and riparian habitat to be suitable for arroyo toads, all riparian habitat types are taken into account for disturbance estimates. However, because the arroyo toad suitable habitat is actually very specific and is also determined by many microhabitat features, estimates of suitable arroyo toad habitat within the Project area based on the availability of general riparian habitat types is likely an overestimate of the amount of suitable habitat within the Project area and its vicinity. Total acreage of riparian habitat within each BRRTP alternative or component on the ANF is presented in Table 10. These calculations are based on the 500-foot wide corridor and include projected habitat disturbance from construction staging areas and access roads.

TABLE 10. TOTAL ARROYO TOAD HABITAT ACREAGE OF EACH BRRTP COMPONENT ON ANF AND PERCENTAGE OF TOTAL ANF

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2A	ALTERNATIVE 3	RECONDUCTORING	NEW CIRCUIT
Total Acres of Suitable Arroyo Toad Habitat within the Analysis Area	26.92	46.84	41.84	6.47	87.31	15.38
Percentage of Total Riparian Habitat on the ANF (29,464 acres)	0.09%	0.16%	0.14%	0.02%	0.30%	0.05%
Total Acres of Suitable Arroyo Toad Habitat Impacted within the Analysis Area*	3.71	7.76	7.53	1.03	14.13	2.22
Percentage Impacted of Total Riparian Habitat on the ANF (29,464 acres)	0.01%	0.03%	0.03%	3.50×10^{-3}%	0.05%	0.01%

*This acreage is calculated based on the maximum temporary and permanent acreages and represents a "worst-case scenario" of disturbance.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The percentage of the total arroyo toad habitat for each component relative to the total ANF is above in Table 10.

7.3.3 Direct and Indirect Effects to Arroyo Toad

It is not expected that the BRRTP would have any significant direct or indirect effects on arroyo toads or arroyo toad habitat. The only known population of arroyo toads in the Project area occurs within Castaic Creek north of the Elderberry Forebay. The new circuit would terminate at Castaic Power Plant, and there would be no construction within the creekbed. No arroyo toads were located during surveys conducted during the 2008 and 2009 breeding seasons (POWER 2010a). While suitable habitat is located along various Project components, it is expected that impacts would be mostly avoided, as no-construction buffers would be implemented around RCAs as follows:

- One-mile buffer around known arroyo toad occurrences;
- Any 100-year recurrence interval floodplain boundaries;
- 328 feet (100 meters) from each edge of perennial streams and lakes/reservoirs; and
- 98 feet (30 meters) from each edge of seasonally-flowing/intermittent streams.

However, this does not avoid the possibility that RCAs may be affected by continual vehicle use, especially following any rain events. Additionally, RCAs may be affected if it is deemed that they are currently unsuitable for Project access due to insufficient width or unacceptable road conditions. In these cases the roads through these RCAs would be improved to be suitable for use by Project vehicles and equipment.

Apart from impacts to RCAs and/or suitable habitat, the only foreseeable direct effect to arroyo toads would be direct collision or crushing by the construction crew. This could occur due to vehicles, foot traffic, or actual construction. However, all construction would be distanced from stream edges, reducing the likelihood of any toads being present unless they happen to be actively foraging. Also, adult toads are primarily active at night, and are unlikely to be active during construction hours (USFWS 1999). Additionally, while juvenile toads are active diurnally for their first four to five weeks, they are unlikely to leave streambeds due to predation and will generally stay within sandy or gravelly areas of streams, reducing the likelihood that they would be encountered during construction (USFWS 1999). Finally, there are no known arroyo toad populations within the Project vicinity except north of the Castaic Power Plant within Castaic Creek, and BRRTP construction would not occur within Castaic Creek.

One indirect effect to arroyo toad habitat that may result from construction is the spread of non-native species. Tamarisk and giant reed constitute two of the largest threats to arroyo toads among non-native plant species, as they can eliminate sandbars, breeding pools, and upland habitats (USFWS 2009). Vehicles serve as efficient methods of seed dispersal, and it is possible that non-native seeds may become attached to Project vehicles and equipment, allowing them to move quickly up or down an access road and into a new area. Additionally, any potential leaks from vehicles into stream courses may cause habitat degradation, lowering the quality of suitable arroyo toad habitat.

New 230 kV Transmission Line

Direct and Indirect Effects

A comparison between alternatives of the number of acres and potential impact for each alternative is shown in Table 10. Existing vegetation would be removed, temporarily impacting habitat until native vegetation is recovered. Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for arroyo toads would decrease. It is estimated that the acreage of riparian habitat that would be temporarily impacted on each alternative would be 2.8, 6.2, 5.7, and 0.7 acres for Alternatives 1, 2, 2a, and 3, respectively. While these areas all contain constituents of suitable arroyo toad habitat, because arroyo toads require such specialized aquatic habitat, these numbers may overestimate the actual amount of suitable arroyo toad habitat on each alternative. Although implementation of no-construction buffers around RCAs will reduce the amount of disturbance in riparian areas, in some areas avoidance may not be possible and riparian habitat may be temporarily impacted until the vegetation has recovered or been restored. An additional 0.9, 1.5, 1.8, and 0.3 acres of riparian habitat are expected to be permanently impacted by construction of Alternatives 1, 2, 2a, and 3, respectively.

Post-Project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species in riparian habitat, habitat values for the arroyo toad would decrease. Impacts to vegetation in the vicinity of riparian areas may affect the quality of foraging habitat for arroyo toad. While arroyo toads will forage around and under chaparral, mulefat, or willow thickets as prey availability allows, they are most often found around the drip lines of coast live oak trees, where prey is usually abundant (USFWS 1999). Additionally, impacts to upland habitat may directly or indirectly affect arroyo toad aestivating habitat, although the ecology of their aestivation sites is not well known other than that burrowing typically occurs in stream terraces or in the area between the channel and terraces (USFWS 1999, USFWS 2009).

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that upwards of 100, 50, 78, and 5 RCAs would be affected on Alternatives 1, 2, 2a, and 3, respectively. Extensive vehicular crossings may alter the stream microhabitat, especially if there is water in the crossings during construction, and could affect water retention or flow qualities of these areas, potentially also affecting areas downstream. Any incidental effects from construction, such as vehicle fluid leaks, loss of breeding or foraging habitat, spread of non-native vegetation seeds, or, particularly, soil compaction, would negatively affect riparian and arroyo toad habitat quality.

For several areas within the ANF along Alternatives 1 and 2a, the Forest Service would require that the new double-circuit 230 kV structures be constructed by helicopter. Refer to Figure 8, the Helicopter Mitigation Map, which illustrates the locations. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. The use of helicopter construction would also limit the number of RCAs that could potentially be impacted by the access road construction.

Reconductoring

Direct and Indirect Effects

Suitable habitat for arroyo toad occurs in various streambeds and drainages throughout the entire Project area. Of the estimated 87.3 acres of riparian habitat within the analysis area for the reconductoring, the amount that would be affected by transmission line construction, operation, and maintenance is 9.6 acres of temporary disturbance and 4.5 acres of permanent disturbance. Temporary disturbance represents 11.00% of the total riparian habitat within the reconductoring area and 0.03% of the total riparian habitat available on the ANF, while permanent disturbance represents 5.19% of the total riparian habitat within the analysis area for the reconductoring, and 0.02% of the total riparian habitat available on the ANF. The reconductoring would roughly parallel and be in close proximity to Alternative 2 throughout the ANF. Therefore, many of the areas that it would affect are similar to the Alternative 2 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that the reconductoring operation would cause a similar amount of disturbance on average as the construction of the new transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species in riparian habitat, habitat values for the arroyo toad would decrease. Impacts to vegetation in the vicinity of riparian areas may affect the quality of foraging habitat for arroyo toad. While arroyo toads will forage around and under chaparral, mulefat, or willow thickets as prey availability allows, they are most often found around the drip lines of coast live oak trees, where prey is usually abundant (USFWS 1999). Additionally, impacts to upland habitat may directly or indirectly affect arroyo toad aestivating habitat, although the ecology of their aestivation sites is not well known other than that burrowing typically occurs in stream terraces or in the area between the channel and terraces (USFWS 1999, USFWS 2009).

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. Any incidental effects from construction, such as vehicle fluid leaks, loss of breeding or foraging habitat, spread of non-native vegetation seeds, or, particularly, soil compaction, would negatively affect riparian and arroyo toad habitat quality. It is anticipated that approximately 50 RCAs would be affected by the reconductoring. Most of the impacted RCAs would be the same as those impacted by Alternative 2, but in the short isolated areas where the two ROWs diverge, there may be a small difference in the number of RCAs affected by construction. RCAs would mainly be affected due to insufficient road width.

New 230 kV Circuit

Direct and Indirect Effects

Suitable habitat for arroyo toad occurs in various streambeds and drainages throughout the entire Project area. Of the estimated 15.4 acres of riparian habitat within the analysis area for the new circuit, the amount that would be affected by transmission line construction, operation, and maintenance is 1.7 acres of temporary disturbance and 0.6 acre of permanent disturbance. Temporary disturbance represents 10.7% of the total riparian habitat available in the analysis area for the new circuit and 0.01% of the total riparian habitat available on the ANF, while permanent disturbance represents 3.7% of the total riparian habitat available within the analysis area for the new circuit and 1.9 x 10^{-3}% of the total riparian habitat available on the ANF. The forested portion and much of the non-forested portion of the new circuit would parallel Alternative 1. Therefore, many of the areas that it would affect within the ANF would be similar to the Alternative 1 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that installation of the new circuit would cause a similar amount of disturbance on average as the construction of the new Alternative 1 transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project treatments would require efforts to ensure the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species in riparian habitat, habitat values for the arroyo toad would decrease. Impacts to vegetation in the vicinity of riparian areas may affect the quality of foraging habitat for arroyo toad. While arroyo toads will forage around and under chaparral, mulefat, or willow thickets as prey availability allows, they are most often found around the drip lines of coast live oak trees, where prey is usually abundant (USFWS 1999). Additionally, impacts to upland habitat may directly or indirectly affect arroyo toad aestivation habitat, although the ecology of their aestivating sites is not well known other than that burrowing typically occurs in stream terraces or in the area between the channel and terraces (USFWS 1999, USFWS 2009).

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is expected that one RCA on the ANF may be affected by construction, although there are numerous other streambed crossings outside of the forest, such as in Charlie Canyon.

Cumulative Effects

SCE's ATP identified a high potential for arroyo toad to occur within its project area. The CNDDB lists an arroyo toad record approximately 1.5 miles south of the ATP ROW at San Francisquito Creek (CDFG 2011); in addition, there is designated critical habitat for this species in the Santa Clara River. Possible project impacts considered by ATP included impacts to breeding habitat due to construction work adjacent to San Francisquito Creek or due to crews carrying transmission lines or equipment across the creek on foot; crushing from equipment; disruption of breeding activity; take of toads, egg strands, or larvae; indirect mortality by causing toads to vacate the area; increased predation; habitat alteration and/or degradation as a result of changes in water flows or leaks from vehicles; or loss of upland habitat (Aspen 2006). BRRTP is not expected to have as many of the same impacts as the ATP due to the unlikely possibility of arroyo toads occurring within the BRRTP area, and the population in Castaic Creek is different from the population that may be in San Francisquito Creek near the ATP ROW. However, any impact to arroyo toad individuals or habitat that may occur during BRRTP's construction would cumulatively affect the regional population of arroyo toads.

SCE's TRTP may cause a cumulative reduction in arroyo toad habitat along with BRRTP. It is estimated that Alternative 2 of the TRTP will result in the loss of five acres of arroyo toad habitat and that Alternative 6 of the TRTP will result in the loss of 16 acres of habitat (Aspen 2009). It is estimated that construction of Alternatives 1, 2, 2a, and 3 of the BRRTP would temporarily impact 2.8, 6.2, 5.7, and 0.7 acres and permanently impact 0.9, 1.5, 1.8, and 0.3 acres of riparian habitat, respectively. While these projects are in different halves of the ANF, the mutual habitat loss would reduce forest-wide suitable habitat for this species. Additionally, while it is unknown whether either project would result in arroyo toad injuries or mortalities, because this species can blend in well in its habitat, is heavily reliant on particular stream flows for breeding, and may be burrowed in streambeds, both projects have the possibility of injuring or killing arroyo toads of various life stages if in suitable habitat. The only known population of arroyo toad within the boundaries of the BRRTP is located near Alternative 1.

The ANF is proposing to extend its efforts at invasive plant removal with its Santa Clara River Watershed Invasive Plant Treatment Project. While the ANF conducted removal of giant reed between 1995 and 2005, the ANF has proposed to extend the scope of the removal activities to include other non-native species such as tamarisk (*Tamarix* sp.), tree-of-heaven (*Ailanthus altissima*), yellow star thistle (*Centaurea solstitialis*), and tree tobacco (*Nicotiana glauca*), among others (USFS 2010b, USFS 2010c). It is likely that removing non-native plant species, particularly within streambed areas that have extensive invasive species composition, will benefit arroyo toad habitat. The Forest Service will enforce all necessary mitigation measures for sensitive species as outlined in the project's Purpose and Need and Proposed Action Statement (USFS 2010c). The USFS previously removed invasive weeds along approximately 2.5 miles of streambed in the San Francisquito and Bouquet Creek watersheds (USFS 2010a). While no toads were known to be present in these areas, the improvement in habitat may have benefits for the arroyo toad.

In October 2009, LADWP conducted a repair of the south portal of the Elizabeth Tunnel, part of the Combined Section of the Los Angeles Aqueduct, located in South Portal Canyon. Alternative 2a would be located far up the slopes along the western side of this area. This tunnel has a low continuous water leak that flows after a short distance into the intermittent streambed running through South Portal Canyon. The surrounding intermittent streambed and this specific tunnel repair site were determined to be the most suitable arroyo toad habitat throughout the South Portal Canyon area and were surveyed numerous times during the 2010 arroyo toad breeding season. While no arroyo toads were identified in this area during any surveys, Pacific chorus frogs (*Pseudacris regilla*) and western toads (*Anaxyrus boreas*) were observed in amplexus throughout multiple surveys. While arroyo toad habitat in this area was undoubtedly affected by the sediment and construction action, because the area has since been providing suitable breeding habitat for other anurans, the net change in habitat quality or functionality is likely very little. Any debris that might fall down the slope during construction of Alternative 2a into this area would possibly affect breeding or foraging habitat, creating a cumulative effect with the actions described above, although no arroyo toads were detected here during surveys and they are not known to occur in this area.

The ANF is proposing to reopen the Little Rock Creek Road (Forest Road 5N04) to non-motorized and motorized vehicle use, including OHVs, as well as reopen Alimony Truck Trail (Forest Road 4N15) to non-motorized and street-legal motorized vehicles only. It would also reopen a portion of the current closure area within the Littlerock Recreation Area. Little Rock Creek throughout this area is designated as Unit 21, arroyo toad critical habitat (76 FR 7245 7467). Opening the area up to recreation and vehicle use on roads adjacent to the creek could have negative effects on the arroyo toad, especially because recreation (e.g., walking through streambeds) and road mortality—where arroyo toads disperse or forage on roads—are two primary contributors to the species' decline (USFWS 1999). Arroyo toad mortalities are not expected to occur on the BRRTP due to the distance between construction work and the known occupied habitat in Castaic Creek. However, injuries or mortalities would have a cumulative effect on the species.

7.3.4 Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest Service FEIS (USFS 2005b, Volume 2, page 77) identifies population abundance and/or habitat conditions in selected locations as acceptable methodologies that would assist in measuring population trends. The sections below summarize the habitat and population status and trend data for the arroyo toad. This information is drawn from the information on habitat and population trends in the ANF MIS Report (USFS 2008), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Arroyo toad habitat was modeled on the ANF in 2006, resulting in an estimation of 29,464 acres of arroyo toad habitat encompassing approximately 4% of the total ANF. However, no data on the habitat status or trends is available at this time.

- *Population Status and Trend at the Forest Scale*
  Arroyo toad populations are known within the ANF in Castaic Creek, Big Tujunga Creek and the lower reach of Alder Creek, and Little Rock Creek. Although these sites are surveyed annually, there are no estimates available for total ANF populations of arroyo toad. Survey results are described in greater detail in the ANF MIS Report (USFS 2008).

7.3.5 Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Areas impacted by Project activities would not initially provide suitable habitat for arroyo toads. However, with successful implementation of restoration efforts, the Project area would be expected to provide suitable arroyo toad habitat in the future (more than five years). The Project-level habitat impacts would not alter or contribute to any existing forest-wide population trends for the arroyo toad.

7.4 SONG SPARROW (*MELOSPIZA MELODIA*)

7.4.1 Habitat/Species Relationship

The song sparrow is an MIS for riparian areas because it is believed to be indicative of the health of riparian communities, particularly where birds are concerned, due its high percentage of nests—approximately 90%—within riparian vegetation (Arcese et al. 2002, USFS 2008). They are associated with aquatic and riparian habitats and are affected by ground disturbance including trampling and soil compaction; spread of invasive nonnative species; mortality from collision; and altered stream flow regimes. According to the Forest Service FEIS (USFS 2005b, Volume 2, page 77), the objective for song sparrow on the ANF is to have stable or increasing populations and healthy riparian habitat.

The song sparrow's distribution is highly influenced by the availability of aboveground water, and it is less abundant in areas where riparian vegetation is less common, instead typically occurring in areas with standing or running water (Arcese et al. 2002, Humple and Geupel 2004). Nests are typically built on the ground or over water, but are rarely found within trees (Arcese et al. 2002, USFS 2008). The song sparrow is a permanent resident of coastal scrub and riparian brush over most of the forest (Aspen 2009). Song sparrows are usually located in riparian areas with dense understories, and certain subspecies in California may also inhabit freshwater marshes (Humple and Geupel 2004, USFS 2008). Marshall (1948) concluded that song sparrows' main requirements are a source of water (which in the case of coastal or dune scrub may mean constant moisture from fog, dew, or seepage), moderately dense vegetation, plenty of light, and exposed ground or leaf litter for foraging. The importance of small red alder trees for song sparrows (significant positive correlation between nest success and number of trees within 11.3 m of the nest) within the Golden Gate National Recreation Area suggests the importance of early successional, non-willow riparian habitat for this species (Gardali et al. 1998). In San Diego County, they have been documented nesting in gardens, nurseries, and weedy areas, and may occupy territories as small as 0.05 acre (Unitt 2004). Breeding sites have been recorded typically from 200 feet below sea level to 5,000 feet above sea level, although in Southern California breeding has been documented at elevations up to 8,200 feet (USFS 2008).

Because the song sparrow is so strongly identified with and dependent on riparian habitat, human-related impacts to riparian areas—such as development, recreation, and pollution—are expected to have detrimental effects on this species and its abundance. Additionally, study has indicated that where grazing occurs near song sparrow nesting sites, song sparrow nests are much less likely to be successful than in areas that are ungrazed (Chase 2002). Chase's study in grazed and ungrazed areas (2002) also found that song sparrow nests were more likely to be constructed in shrubby vegetation patches than in herbaceous patches, although the prevalence of California blackberry (*Rubus ursinus*), which in this study largely determined how shrubby an area was, was deemed to not be indicative of nest success. While widespread parasitism was not observed during this study, it is believed that grazing increases parasitism rates on song sparrows by brown-headed cowbirds (*Molothrus ater*) by changing vegetative composition and reducing cover that would otherwise hide song sparrow nests (Chase 2002, USFS 2008).

Sauer et al. (2008) summarize Breeding Bird Survey data, which show a declining trend for the song sparrow in California. An average decrease of 0.3% per year was noted for the period of 1966-2007, with a decline becoming more evident in the 1980-2007 sampling period (-0.9%). Though these results were not statistically significant, they are consistent with what appears to be a nationwide decline in the abundance of this species. Song sparrows are present on all four Southern California National Forests and were recorded at 197 out of 206 stations during the 1988-1997 and 2003 riparian bird count surveys (USFS 2008). Because song sparrows were so abundant during surveys, negative trends in abundance were able to be determined over time, giving results consistent with those determined by the Breeding Bird Surveys (USFS 2008).

As stated above, threats to riparian habitat inherently threaten song sparrows and their use or continued use of an area. Predation is another factor that has affected the success of song sparrow nests and persistence, with brown-headed cowbirds in particular being implicated in nest failure due to their habit of brood parasitism by which they place their eggs in the nest of another bird (USFS 2008). Other predators that may affect song sparrows can include gopher snakes (*Pituophis catenifer*), western terrestrial garter snakes (*Thamnophis elegans*), and western scrub-jays (*Aphelocoma californica*), along with various rodents or domesticated animals such as cats and dogs (Chase 2002, USFS 2008).

San Francisquito Canyon, which parallels the proposed Alternative 2 corridor at a distance of about two miles, contains suitable song sparrow habitat. A song sparrow was identified during 2009 RCA surveys along Alternative 2 north of Drinkwater Flat (POWER 2010e). Additional habitat exists around Grass Mountain near the community of Green Valley, in Dry Canyon, and along the new circuit, particularly near the West Fork of Liebre Creek.

A habitat assessment for riparian birds was conducted in 2008 (POWER 2009) and Bird Use Counts were conducted in 2010 (POWER 2011). No protocol surveys for song sparrows were conducted specifically for the BRRTP area. Breeding Bird Survey summary results for the entire State of California do not show a statistically significant change from 1966 to 2007 (Sauer et al. 2008). General song sparrow numbers for California from the Audubon Society's Christmas Bird Counts appear to be relatively stable over the last 25 years, generally fluctuating annually in the range between 15,000 and 18,000, with occasional numbers near 13,000 or exceeding 19,000 song sparrows detected (Audubon 2010a). Song sparrow counts from 1972 to 1997 for Grass Mountain, which Alternative 2 would run along the base of in San Francisquito Canyon, show large fluctuations in the numbers of song sparrows detected in this area, varying from only one in many years to a high of 134 in 1996 (Audubon 2010b). The counts for 1995 – 1997 show, respectively, 10, 134, and 5 song sparrows recorded; no data past 1997 is available for Grass Mountain.

7.4.2 Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis: Availability of shrub type riparian vegetation and early seral non-willow riparian vegetation in close proximity to surface water during the breeding season is a limiting factor for song sparrow. The Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers aquatic and riparian habitat as suitable for the song sparrow. The Forest Service uses a different vegetation community classification system (CalVeg) than BRRTP (Holland [1986]); BRRTP analysis utilized Holland (1986) vegetation communities to produce the estimated disturbance impacts listed in Table 11. The table below illustrates the expected correlation between the Holland (1986) vegetation communities and the CalVeg vegetation communities that the Forest Service uses. The CalVeg communities listed below are those that are cited by the Forest Service as being suitable for song sparrow in the ANF MIS Report (USFS 2008). Correlations were determined based on mutual dominant or associated species and features of respective communities. For most communities below, a clear link can be seen between a Holland (1986) community and a CalVeg community. For instance, the Holland (1986)

"Southern Willow Scrub" is closely correlated with the CalVeg "Willow Alliance," as well as with the "Riparian Mixed Hardwood Alliance," which contains numerous co-dominant species. However, species composition elements of Southern Willow Scrub are also present within other CalVeg communities such as "California Sycamore Alliance" and "White Alder Alliance." "Southern Coast Live Oak Riparian Forest," however, has no direct correlation with the CalVeg communities listed by the Forest Service as being suitable habitat for song sparrow (USFS 2008). Alternatively, coast live oaks are associated species of both the "California Sycamore Alliance" and "Willow Alliance" communities, so these were listed in the table below as containing elements of this community while not being exact substitutions. The CalVeg communities "California Bay Alliance" and "Black Cottonwood Alliance" were not included because their dominant species were not detected in the BRRTP vicinity during 2008 – 2010 botanical surveys.

TABLE 11. BRRTP HOLLAND (1986) COMMUNITIES AND CORRELATING FOREST SERVICE CALVEG COMMUNITIES – SONG SPARROW

BRRTP SUITABLE SONG SPARROW RIPARIAN VEGETATION COMMUNITIES	CORRELATING CALVEG SONG SPARROW VEGETATION COMMUNITIES
Southern Coast Live Oak Riparian Forest	*California Sycamore Alliance* *Willow Alliance*
Southern Cottonwood Willow Riparian Forest	*California Sycamore Alliance* Riparian Mixed Hardwood Alliance *White Alder Alliance* Willow Alliance
Southern Riparian Scrub	*California Sycamore Alliance* Riparian Mixed Hardwood Alliance *White Alder Alliance* Willow Alliance
Southern Sycamore Alder Riparian Woodland	California Sycamore Alliance Riparian Mixed Hardwood Alliance White Alder Alliance *Willow Alliance*
Southern Willow Scrub	*California Sycamore Alliance* Riparian Mixed Hardwood Alliance *White Alder Alliance* Willow Alliance

Note: CalVeg communities in italics are those that may contain strong elements of the Holland (1986) communities, but for which the dominant species in the Holland community is an associate, not a dominant, species of the CalVeg community.

Analysis Area for Project-level Effects Analysis: The analysis area for direct, indirect, and cumulative effects of the BRRTP on song sparrows varies according to Project components, which overlap and encompass different vegetation areas. Because the Forest Service FEIS (USFS 2005b, Volume 2, page 77) considers aquatic and riparian habitat to be suitable for song sparrows, all riparian habitat types within BRRTP are taken into account for disturbance estimates. Since the Forest Service CalVeg and the BRRTP Holland (1986) community classification systems vary, the BRRTP vegetation communities were verified for similarity to appropriate CalVeg communities in Table 11 above. Thus, while communities may not be exactly the same, the substitution between classification systems is close enough that disturbance to the BRRTP communities listed in Table 11 above should correlate closely to disturbance to song sparrow habitat as defined by the Forest Service CalVeg system. Using these correlations, the total acreage of suitable song sparrow habitat within each Project alternative or component on the ANF is presented in Table 12. These calculations are based on the 500-foot wide corridor and include projected habitat disturbance from construction staging areas and access roads.

TABLE 12. TOTAL SONG SPARROW HABITAT ACREAGE OF EACH BRRTP COMPONENT ON ANF AND PERCENTAGE OF TOTAL ANF

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2A	ALTERNATIVE 3	RECONDUCTORING	NEW CIRCUIT
Total Acres of Suitable Song Sparrow Habitat within the Analysis Area	26.92	46.84	41.84	6.47	87.31	15.38
Percentage of Total Song Sparrow Habitat on the ANF (4,549 acres)	0.59%	1.03%	0.92%	0.14%	1.92%	0.34%
Total Acres of Suitable Song Sparrow Habitat Impacted within the Analysis Area*	3.71	7.76	7.53	1.03	14.13	2.22
Percentage Impacted of Total Riparian Habitat on the ANF (4,549 acres)	0.08%	0.17%	0.17%	0.02%	0.31%	0.05%

*This acreage is calculated based on the maximum temporary and permanent acreages and represents a "worst-case scenario" of disturbance.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The percentage of the total song sparrow habitat for each component relative to the total ANF is above in Table 12.

7.4.3 Direct and Indirect Effects to Song Sparrow

Song sparrows have been documented by POWER during surveys for the BRRTP on Alternatives 1, 2, 2a, the reconductoring corridor, and the new 230 kV circuit (POWER 2010e, POWER 2011). If construction activities are concurrent with nesting season, then impacts to song sparrow breeding success is possible. However, construction is expected to occur outside of the general breeding season, and implementation of this Project is not expected to have significant direct effects upon song sparrows since permanent alteration of riparian habitat is expected to be minimal. GPs for the Project include building transmission towers to avoid riparian areas, avoidance of blading new access roads when feasible, the implementation of a Restoration and Revegetation Plan, and mitigation requirements to be described in the finalized Streambed Alteration Agreement with CDFG.

Indirect effects to song sparrows would probably be positive as vegetation recovers. Periodic rejuvenation of streamside vegetation after flooding events is considered an improvement for many wildlife species and is a natural factor in long-term riparian health. Habitat degradation as a result of spread of non-native species, dust, or vehicular fluid leaks could make habitat patches less attractive to song sparrows.

New 230 kV Transmission Line

Direct and Indirect Effects

Song sparrows are associated with brushy riparian vegetation or the early seral stage of riparian trees. A comparison between alternatives of the number of acres and potential impact for each alternative is shown in Table 12. Existing vegetation would be removed, temporarily impacting habitat until native vegetation is recovered. Areas of permanent disturbance would not be revegetated and would be maintained as part of the transmission line's operation and maintenance activities.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for song sparrow would decrease. The estimated acreage of riparian vegetation to be impacted on each alternative is 1.5, 6.2, 5.7, and 0.7 acres for Alternatives 1, 2, 2a, and 3, respectively.

Existing foraging and nesting habitat would be removed and would require years for recovery. Until native vegetation is recovered, these areas would not provide suitable habitat for the song sparrow. Once native vegetation such as willow and mulefat is established, the area would again provide suitable habitat for the song sparrow. However, this vegetation would require several years to reach the conditions necessary for nesting song sparrows.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that upwards of 100, 50, 78, and 5 RCAs would be affected on Alternatives 1, 2, 2a, and 3, respectively. Some RCAs were already affected on Alternatives 2 and 2a in 2009 by unauthorized grading by LADWP, as discussed in the Cumulative Effects section. For several areas within the ANF along Alternatives 1 and 2a, the Forest Service would require that the new double-circuit 230 kV structures be constructed by helicopter. Refer to Figure 8, the Helicopter Mitigation Map, which illustrates the locations. The use of helicopters for the construction of transmission tower structures would eliminate the need for new access roads to structure locations, and would therefore minimize land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for delivery of structures to sites. The use of helicopter construction would also limit the number of RCAs that could potentially be impacted by the access road construction.

Reconductoring

Direct and Indirect Effects

Song sparrows are associated with brushy riparian vegetation or the early seral stage of riparian trees. Of the estimated 87.3 acres of suitable song sparrow habitat within the analysis area for the reconductoring, the amount that would be affected by transmission line construction, operation, and maintenance is 9.6 acres of temporary disturbance and 4.5 acres of permanent disturbance. Temporary disturbance represents 11.0% of the total suitable song sparrow habitat available in the analysis area for the reconductoring and 0.2% of the total suitable song sparrow habitat available on the ANF. Permanent disturbance represents 5.2% of the total suitable song sparrow habitat available within the analysis area for the reconductoring and 0.1% of the total suitable song sparrow habitat available on the ANF. The reconductoring would roughly parallel and be in close proximity to Alternative 2 throughout the ANF. Therefore, many of the areas that it would affect are similar to the Alternative 2 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that the reconductoring operation would cause a similar amount of disturbance on average as the construction of the new transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for song sparrow would decrease. Existing foraging and nesting habitat would be removed and would require years for recovery. Until native vegetation is recovered, these areas would not provide suitable habitat for the song sparrow. Once native vegetation such as willow and mulefat is established, the area would again provide suitable habitat for the song sparrow. However, this vegetation would require several years to reach the conditions necessary for nesting song sparrows.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that approximately 50 RCAs would be affected by the reconductoring. Some of these were already affected in 2009 by unauthorized grading conducted by LADWP, as discussed in the Cumulative Effects section. Most of the impacted RCAs along the length of the reconductoring corridor would be the same as those impacted by Alternative 2, but in the short isolated areas where the two ROWs diverge, there may be a small difference in the number of RCAs affected by construction.

New 230 kV Circuit

Direct and Indirect Effects

Song sparrows are associated with brushy riparian vegetation or the early seral stage of riparian trees. Of the estimated 15.4 acres of suitable song sparrow habitat within the analysis area for the new circuit, the amount that would be affected by transmission line construction, operation, and maintenance is 1.7 acres of temporary disturbance and 0.6 acre of permanent disturbance. Temporary disturbance represents 10.7% of the total suitable song sparrow habitat available within the analysis area for the new circuit and 0.04% of the total suitable song sparrow habitat on the ANF. Permanent disturbance represents 3.7% of the total suitable song sparrow habitat available within the analysis area for the new circuit and 0.01% of the total suitable song sparrow habitat available on the ANF. The forested portion and much of the non-forested portion of the new circuit would parallel Alternative 1. Therefore, many of the areas that it would affect within the ANF are similar to the Alternative 1 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that installation of the new circuit would cause a similar amount of disturbance on average as the construction of the new Alternative 1 transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for song sparrow would decrease. Existing foraging and nesting habitat would be removed and would require years for recovery. Until native vegetation is recovered, these areas would not provide suitable habitat for the song sparrow. Once native vegetation such as willow and mulefat is established, the area would again provide suitable habitat for the song sparrow. However, this vegetation would require several years to reach the conditions necessary for nesting song sparrows.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is expected that one RCA on the ANF may be affected by construction. There are numerous other streambed crossings outside of the forest, such as in Charlie Canyon.

Cumulative Effects

SCE's ATP may cause a cumulative effect to song sparrows along with BRRTP. Although the ATP was expected to largely avoid additional impacts to song sparrow habitat by spanning drainages, avoiding impacts to riparian vegetation and RCAs, and restricting project access to existing roads near riparian habitat, any negative effects to the song sparrow from the ATP would exert a cumulate effect on song sparrow with the BRRTP, as song sparrows were documented in 2009 and 2010 directly within the proposed BRRTP ROW. Construction on ATP was completed in October 2009 and the transmission line is now energized. Construction on the BRRTP is not anticipated to begin until 2013, providing at least three breeding seasons for song sparrows to return to their territories or find new territories as necessary. Due to the localized nature of construction (i.e., construct at one site and then move to the next), it is possible that the sparrows were not displaced for long amounts of time, where construction was in the vicinity of riparian areas. If construction was conducted in the off-season in these areas, song sparrow breeding may have not have been impacted. If BRRTP cannot be timed outside of the nesting season, preconstruction nesting surveys will reduce the likelihood of affecting this species' breeding activities.

SCE's TRTP may cause a cumulative reduction in song sparrow habitat along with BRRTP. It is estimated that Alternative 2 of the TRTP will result in the loss of 0.67 acre of song sparrow habitat and that Alternative 6 of the TRTP will result in the loss of 0.07 acre of habitat (Aspen 2009). It is estimated that construction of Alternatives 1, 2, 2a, and 3 of the BRRTP would temporarily impact 2.8, 6.2, 5.7, and 0.7 acres and permanently impact 0.9, 1.5, 1.8, and 0.3 acres of riparian habitat, respectively. While these projects are in different halves of the ANF, the mutual habitat loss would reduce forest-wide suitable habitat for this species.

In April 2009, LADWP conducted unauthorized road grading along City Highline Road, a road that would provide partial access to Alternatives 2 and 2a as well as the reconductoring corridor. The effects of this grading, such as riparian habitat loss, will likely cause a cumulative effect on song sparrows with the BRRTP and any habitat loss or degradation that could occur as a result of BRRTP's construction. The required remedial actions for this grading, such as habitat restoration, may reduce the negative cumulative impacts associated with the other actions by improving the habitat in these areas. One song sparrow was detected in the graded area during RCA surveys prior to this action, but no individuals were detected during subsequent surveys documenting damage (POWER 2010e).

Non-native plant removal and fuel management activities are planned throughout the ANF. The ANF is proposing to extend its efforts at invasive plant removal with its Santa Clara River Watershed Invasive Plant Treatment Project. While the ANF conducted removal of giant reed between 1995 and 2005, the ANF has proposed to extend the scope of the removal activities to include other non-native species such as tamarisk, tree-of-heaven, yellow star thistle, and tree tobacco, among others (USFS 2010b, USFS 2010c). The Forest Service will enforce all necessary mitigation measures for sensitive species as outlined in the project's Purpose and Need and Proposed Action Statement (USFS 2010c). Song sparrows will benefit if these treatments contribute to less encroachment of non-native plants into the riparian area.

The ANF has closed several grazing areas within the forest including the Charlie grazing allotment located within the Alternative 1 ROW, the Drinkwater grazing allotment located within the Alternatives 2 and 2a ROWs, and the Texas-Vasquez grazing allotment partially located within the Alternative 3 ROW (USFS 2010d). The Drinkwater grazing allotment is the area where a song sparrow was detected during 2009 BRRTP RCA surveys along Alternative 2 (POWER 2010e). These allotments make up 50,862 acres of NFS lands, with the Charlie, Drinkwater, and Texas-Vasquez grazing allotments taking up 7,558 acres, 6,989, and 4,704 acres of NFS lands, respectively. According to the Forest Service, the allotments have not been grazed for several years (the Charlie grazing allotment was last grazed in 1993, Drinkwater in 2001, and Texas-Vasquez in 2002) and, to cut administrative costs, it was more beneficial to remove them from livestock grazing opportunities. Based on findings by Chase (2002), it is likely that removing the possibility of future grazing within these areas will benefit song sparrows by increasing nest cover and reducing the likelihood of nest predation by grazing-related vegetation removal or nest destruction.

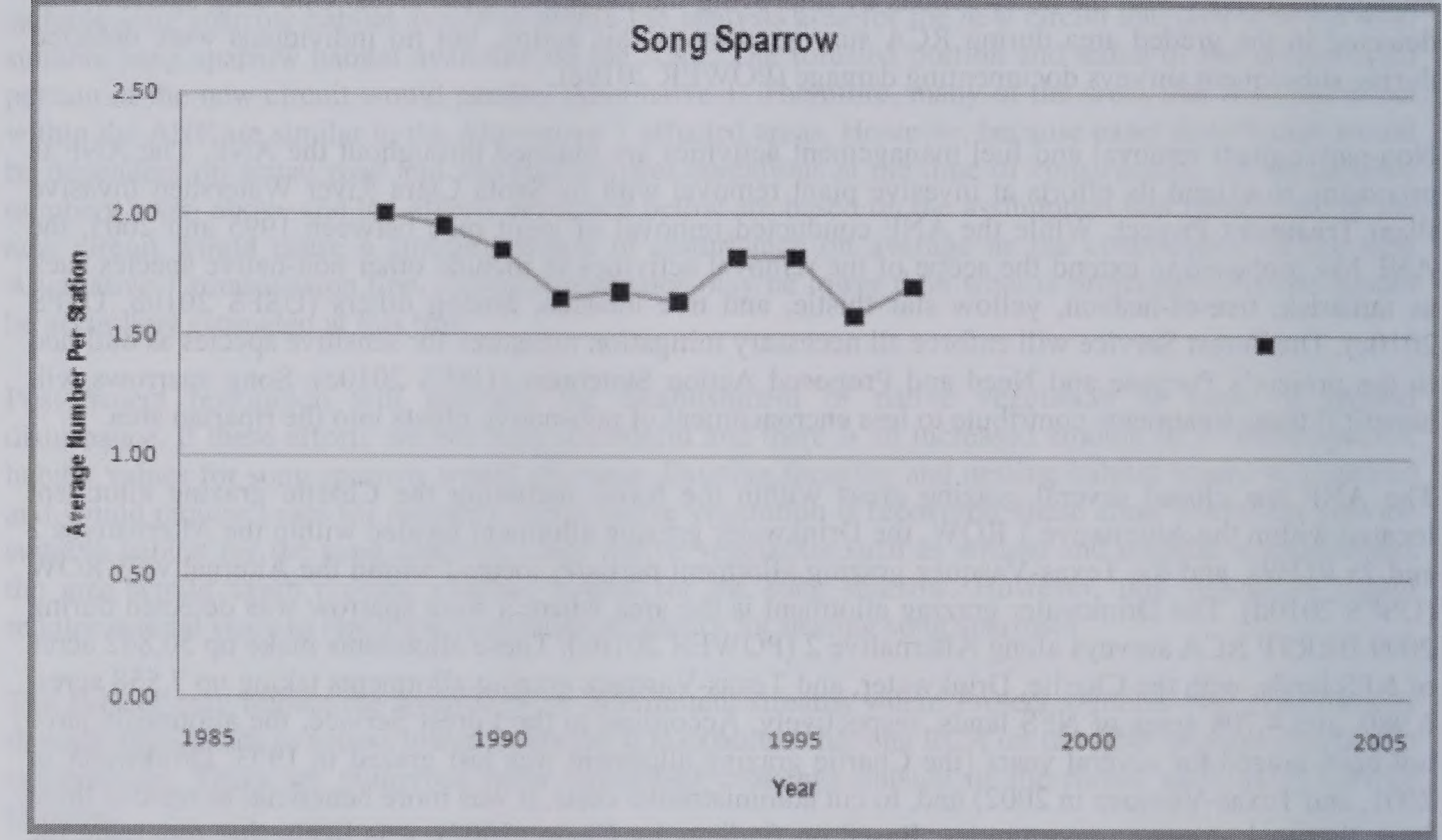
7.4.4 Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest Service FEIS (USFS 2005b, Volume 2, page 77) identifies riparian bird species point counts and/or habitat conditions as acceptable methodologies. Trends would be measured according to abundance and/or habitat condition. The sections below summarize the habitat and population status and trend data for the song sparrow. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USFS 2008), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Not utilized as the primary monitoring tool for song sparrows on the ANF.
- *Population Status and Trend at the Forest Scale*
  Song sparrows are well-represented on all four Southern California National Forests; they were recorded at 197 out of 206 stations during the 1988-1997 and 2003 riparian bird count surveys. In any one year, song sparrows were detected at 46% of the survey stations. This species is one of a few that were numerous enough to estimate trends with good confidence.

Negative trends in song sparrow abundance were determined from this monitoring. This negative trend was consistent with California Breeding Bird Survey trends as well as trends for other species in the riparian bird count studies for Southern California forests. The following graph illustrates song sparrow detections on the ANF during the riparian bird count surveys conducted from 1988-1997. Detailed information on this population data is presented in the ANF MIS Report (USFS 2008).

FIGURE 10. SONG SPARROW RESULTS FOR ANGELES NATIONAL FOREST



7.4.5 Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Areas impacted by Project activities would not initially provide suitable habitat for song sparrows. However, with successful implementation of restoration efforts, the Project area would be expected to provide suitable song sparrow habitat in the future (more than five years).

The total area impacted by the Project would be small. Song sparrows are limited to riparian habitats, which represent less than 1% total habitat on the ANF, and the total cumulative amount of temporarily and permanently affected suitable habitat across all components is less than 1% of this amount. The Project-level habitat impacts would not alter or contribute to the existing forest-wide population trends for the song sparrow.

7.5 CALIFORNIA SPOTTED OWL (*STRIX OCCIDENTALIS OCCIDENTALIS*)

7.5.1 Habitat/Species Relationship

The California spotted owl was chosen as an MIS to indicate the health of mature montane conifer forests with dense, multi-layered canopies. The California spotted owl also occupies hardwood forests at low elevations, particularly oak, and studies in the San Bernardino Mountains have indicated that spotted owls may have better reproductive success at these lower elevation habitats because their primary prey, woodrats, are present in high densities in lower elevation areas (Stephenson and Calcarone 1999).

Experts have been concerned about the viability of the Southern California spotted owl population for many years, and this concern has only increased with the damaging drought, recent wildfires, and rapid development of habitat. The cumulative effects of these factors further reduce and isolate California spotted owl populations.

Southern California spotted owls occur within four types of forests: riparian/hardwood, live oak/big cone Douglas-fir, mixed conifer, and redwood/California laurel forests, all of which occur on the four Southern California National Forests except redwood forests, which are only present on Los Padres National Forest (USFS 2008). Spotted owls are estimated to need trees that are at least approximately 15 inches in diameter at breast height (DBH) and 20 feet tall for habitat to be considered suitable (Gutiérrez et al. 1992). Because of this need for larger trees, California spotted owls are particularly susceptible to any fires or disturbances that are strong enough to damage or eliminate whole stands of trees (USFS 2008).

Home ranges for the California spotted owl are believed to be variable depending on the location, specific habitat type, and prey density. Zimmerman et al. (2001) estimated that the home ranges for owl pairs in the San Bernardino Mountains can vary from 800 to 2,016 acres during the breeding season. On the other hand, Zabel et al. (1992) found that home ranges can be upwards of 5,300 acres in the San Bernardino Mountains, or as little as 98 to 243 acres for riparian/hardwood forests in the Cleveland, Angeles, and Los Padres National Forests. Stephenson and Calcarone (1999) estimate a minimum of 300 acres of mature forest habitat is required per pair of California spotted owls.

Due to a lack of comprehensive data, it is difficult to estimate the condition of California spotted owls in Southern California. As of 1994, there were a total of 59 documented California spotted owl territories within the ANF, 48 of which were live oak/big cone Douglas fir and 11 of which were mixed conifer forests (USFS 2008). This data has not been updated since 1994, but due to a historic drought between 2002 and 2005 and the associated losses of mixed conifer and big cone Douglas fir forests, followed by relatively lower annual tree mortalities in the years since (Table 13), it is unknown exactly how many suitable California spotted owl territories remain on the ANF. Stephenson and Calcarone (1999) estimated approximately 60 occurrences on the ANF within the San Gabriel Mountains and an additional 12 occupied areas within the Castaic Ranges of the ANF. Wildfires also play a pivotal role in the survival of California spotted owls and their habitat, particularly in Southern California.

TABLE 13. ACRES OF WOODY PLANT MORTALITY* ON THE ANF

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Acres	394	965	11,570	62,600	3,865	206	7,546	580	299	324

Data from Forest Service Region 5 Forest Health Protection aerial detection surveys (USFS 2005b, Volume 1, page 87; USFS 2004 – 2010).
*Note: The above numbers do not generally include areas with less than one tree per acre (considered "background mortality"). Also, they represent new tree deaths each year, and not necessarily new areas of mortality.

Population information for California spotted owls in Southern California is not strong enough for a reliable determination on population trends. A study submitted to the Forest Service by Franklin et al. (2003) suggested that available population trend data for all California spotted owls do not indicate a decline in the population, with concern warranted for the San Bernardino population. Franklin also pointed out that his sampling period of seven to ten years may not be long enough to detect meaningful trends in spotted owl population dynamics. However, LaHaye et al. (1994) predicted a high risk of the Southern California meta-population becoming extirpated within the next 30 to 40 years, unless the observed decline was temporary, such as a drought. Surveys conducted in 2003 by LaHaye (2004) found California spotted owl occupancy rates in historic territories to be approximately 50 percent in the San Bernardino Mountains and approximately 20 percent in the San Jacinto Mountains, raising a risk of extirpation in the San Jacinto Mountains without sufficient recolonization.

While population monitoring on the ANF has been irregular over the last 20 years, surveys were conducted from 2005 to 2008 in California spotted owl territory (USFS 2008). The results of these surveys are displayed below in Table 14.

TABLE 14. RESULTS OF ANF SURVEYS IN CALIFORNIA SPOTTED OWL TERRITORIES, 2005 – 2008

YEAR	OCCUPIED SITES LOCATED	SITES SURVEYED	PERCENTAGE OF SURVEYED SITES OCCUPIED	SINGLE MALES	PAIRS	NUMBER OF YOUNG DETECTED
2005	7	-	-	6	1	2
2006	4	22	18%	2	2	1
2007	3	10	30%	2	1	2
2008	5	30	17%	3	2	0

Data from MIS Report for the Angeles National Forest (USFS 2008).

California spotted owl protocol surveys were conducted on ANF for the BRRTP in 2008, 2009, and 2010. Survey criteria specified that potential habitat would consist of any conifer, oak woodland, or riparian corridor with a closed canopy with several trees larger than 24 inches DBH. During the BRRTP field assessments, eight sites were determined as potential habitat on Alternative 2, along with one site in the new circuit area (POWER 2010b). However, no California spotted owls were detected during surveys. A total of 25 great-horned owls were detected during surveys, which may have reduced the ability to detect any California spotted owls in the area, as great-horned owls are predators of spotted owls (POWER 2010b).

7.5.2 Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis: According to the Forest Service FEIS (USFS 2005b, Volume 2, page 78), sustained quality and quantity of mixed conifer forests are key to the health of California spotted owls. These are monitored by keeping track of occupied territories and/or habitat conditions and are often influenced by wildfire occurrences. Therefore, mixed conifer forests within the Project area are considered potentially suitable habitat that could be potentially impacted by the BRRTP.

TABLE 15. BRRTP HOLLAND (1986) COMMUNITIES AND CORRELATING FOREST SERVICE CALVEG COMMUNITIES – SPOTTED OWL

BRRTP SUITABLE CALIFORNIA SPOTTED OWL VEGETATION COMMUNITIES	CORRELATING CALVEG CALIFORNIA SPOTTED OWL VEGETATION COMMUNITIES
Canyon Live Oak Forest	Canyon Live Oak Alliance Interior Mixed Hardwood Alliance
Interior Live Oak Chaparral	*Canyon Live Oak Alliance* Interior Live Oak Alliance Interior Mixed Hardwood Alliance
Southern Coast Live Oak Riparian Forest	*Fremont Cottonwood Alliance* *Interior Mixed Hardwood Alliance*
Southern Cottonwood Willow Riparian Forest	Fremont Cottonwood Alliance *White Alder Alliance*
Southern Riparian Scrub	*Fremont Cottonwood Alliance* *White Alder Alliance*
Southern Sycamore Alder Riparian Woodland	*Fremont Cottonwood Alliance* White Alder Alliance
Southern Willow Scrub	*Fremont Cottonwood Alliance* *White Alder Alliance*

Note: CalVeg communities in italics are those that may contain strong elements of the Holland (1986) communities, but for which the dominant species in the Holland community is an associate, not a dominant, species of the CalVeg community.

Analysis Area for Project-level Effects Analysis: The analysis area for direct, indirect, and cumulative effects of the BRRTP on California spotted owls varies according to Project components, which overlap and encompass different vegetation areas. Since the Forest Service CalVeg and the BRRTP Holland (1986) community classification systems vary, the BRRTP vegetation communities were verified for similarity to appropriate CalVeg communities in Table 15 above. Thus, while communities may not be exactly the same, the substitution between classification systems is close enough that disturbance to the BRRTP communities listed in Table 15 above should correlate closely to disturbance to California spotted owl habitat as defined by the Forest Service CalVeg system. Using these correlations, the total acreage of California spotted owl habitat within each Project alternative or component on the ANF is presented in Table 16 below. These calculations are based on the 500-foot wide corridor and include projected habitat disturbance from construction staging areas and access roads.

TABLE 16. TOTAL CALIFORNIA SPOTTED OWL HABITAT ACREAGE OF EACH BRRTP COMPONENT ON ANF AND PERCENTAGE OF TOTAL HABITAT ON ANF

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2A*	ALTERNATIVE 3	RECONDUCTORING	NEW CIRCUIT
Total Acres of Suitable California Spotted Owl Habitat within the Analysis Area	26.92	46.84	95.76	6.47	87.31	15.38
Percentage of Total California Spotted Owl Habitat on ANF (142,953 acres)	0.02%	0.03%	0.07%	4.53×10^{-3}%	0.06%	0.01%
Total Acres of Suitable California Spotted Owl Habitat Impacted within the Analysis Area†	3.71	7.76	15.19	0.69	14.13	2.22
Percentage Impacted of Total California Spotted Owl Habitat on the ANF (142,953 acres)	2.60×10^{-3}%	0.01%	0.01%	4.83×10^{-4}%	0.01%	1.55×10^{-3}%

* The total acres of suitable habitat present and impacted within this alternative are underestimated due to the uncertain number of acres of the Canyon Live Oak Forest vegetation community on this alternative. These numbers refer to all suitable habitat as displayed in Table 16 except for Canyon Live Oak Forest. Please refer to Table 3 for a full explanation.

† This acreage is calculated based on the maximum temporary and permanent acreages and represents a "worst case scenario" of disturbance.

Current Condition of the Key Habitat Factor(s) in the Analysis Area: The percentage of the total California spotted owl habitat for each component relative to the total ANF is above in Table 16.

7.5.3 Direct and Indirect Effects to California Spotted Owl

If construction activities are concurrent with nesting season, then impact to California spotted owl breeding success is possible, not just with impacts to riparian areas, but with impacts to other spotted owl habitats as mentioned previously (such as live oak or mixed conifer forests). However, construction is expected to be scheduled outside of the typical breeding season, and this is not expected to be a concern. It is expected that there may be some negative direct effects to spotted owls, particularly from construction noise, which may result in displacement, and any tree trimming, which may result in displacement, injury, or mortality of any owls that happen to be present. However, GPs—such as tower avoidance of known habitat or territories, presence of a biological monitor, and efforts to minimize the construction footprint—are expected to reduce the likelihood and severity of any direct effects. One notable indirect effect that may occur is the enhancement of spotted owl habitat through the destruction of neighboring chaparral. Chaparral clearing may enhance spotted owl foraging habitat by eventually providing new plants for woodrats to feed on, increasing the number of woodrats in the area, and by opening up the canopy cover to allow owls to better feed on woodrats and other prey (USFS 2008).

New 230 kV Transmission Line

Direct and Indirect Effects

A comparison between alternatives of the number of acres and potential impact for each alternative is shown in Table 8. Existing vegetation would be removed, temporarily impacting habitat until native vegetation is recovered. Areas of permanent disturbance would not be revegetated and would be maintained as part of the transmission line's operation and maintenance activities. A temporary alternative transmission line would be required for construction of Alternative 2 around the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded. This temporary transmission line would be approximately 7.5 miles long from near LADWP's Power Plant 1 to just north of Johnson Road in Elizabeth Lake and would constitute 4.18 acres of temporary disturbance. The proposed corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Additionally, there are numerous oak trees lining San Francisquito Canyon Road in the Green Valley area and, although this is a more developed area of the canyon, these trees could be affected by construction of the transmission line parallel to the roadway.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for the California spotted owl would decrease. This would be especially true for the acres of riparian habitat to be temporarily impacted (1.5, 6.2, 5.7, and 0.7 acres for Alternatives 1, 2, 2a, and 3, respectively). The conversion from Holland (1986) to the CalVeg system indicated that preferred habitats for the California spotted owl align with riparian habitats identified in Holland (1986) for BRRTP. Until native vegetation is recovered, these areas would not provide suitable habitat for the California spotted owl. Oak trees along routes used for construction may require trimming at the time of construction for each alternative. Some oaks were already trimmed throughout the Drinkwater Flat area during unauthorized grading by LADWP in 2009, as discussed in the Cumulative Effects section. While actual tree removal is expected to be minimal, if at all necessary, trees may be trimmed and understory would be removed in areas as required for construction. Once native vegetation has reestablished, the area would provide suitable habitat for the California spotted owl. However, this vegetation would require several years to reach the conditions necessary for nesting spotted owls.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that upwards of 100, 50, 78, and 5 RCAs would be affected on Alternatives 1, 2, 2a, and 3, respectively. Due to the limited road access, helicopter construction would be used to limit the anticipated impacts to the RCAs. Figure 8, the Helicopter Mitigation Map, illustrates potential locations for helicopter construction in relation to the various alternatives.

Reconductoring

Direct and Indirect Effects

California spotted owls are associated with mature conifer forests with dense, multi-layered canopies (USFS 2005b, Volume 2, page 78). Of the estimated 87.3 acres of suitable California spotted owl habitat within the analysis area for the reconductoring, the amount that would be affected by transmission line construction, operation, and maintenance is 9.6 acres of temporary disturbance and 4.5 acres of permanent disturbance. Temporary disturbance represents 0.01% of the total suitable California spotted owl habitat available on the ANF. Permanent disturbance represents $3.2 \times 10^{-3}\%$ of the total suitable California spotted owl habitat available on the ANF. The reconductoring would roughly parallel and be in close proximity to Alternative 2 throughout the ANF. Therefore, many of the areas that it would affect would be similar to the Alternative 2 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that the reconductoring operation would cause a similar amount of disturbance on average as the construction of the new transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for the California spotted owl would decrease. Until native vegetation is recovered, these areas would not provide suitable habitat for the California spotted owl. Oak trees along routes used for construction may require trimming at the time of construction. Some oaks were already trimmed throughout the Drinkwater Flat area in 2009 during unauthorized grading by LADWP, as discussed in the Cumulative Effects section. While actual tree removal is expected to be minimal, if at all necessary, trees may be trimmed and understory would be removed in areas as required for construction. Once native vegetation has reestablished, the area would provide suitable habitat for the California spotted owl. However, this vegetation would require several years to reach the conditions necessary for nesting spotted owls.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is anticipated that approximately 50 RCAs would be affected by the reconductoring. Most of the impacted RCAs would be the same as those impacted by Alternative 2, but in the short isolated areas where the two ROWs diverge, there may be a small difference in the number of RCAs affected by construction.

New 230 kV Circuit

Direct and Indirect Effects

California spotted owls are associated with mature conifer forests with dense, multi-layered canopies (USFS 2005b, Volume 2, page 78). Of the estimated 15.4 acres of suitable California spotted owl habitat within the ANF in the analysis area for the new circuit, the amount that would be affected by transmission line construction, operation, and maintenance is 1.7 acres of temporary disturbance and 0.6 acre of permanent disturbance. Temporary disturbance represents 1.2 x 10^{-3}% of the total suitable California spotted owl habitat available on the ANF. Permanent disturbance represents 4.0 x 10^{-4}% of the total suitable California spotted owl habitat available on the ANF. The forested portion and much of the non-forested portion of the new circuit would parallel Alternative 1 for a short distance south of Castaic Reservoir. Therefore, some of the areas that it would affect within the ANF would be similar to the Alternative 1 affected areas. However, because exact disturbance would be dependent on actual road and individual tower conditions at the time of construction, the disturbance numbers given above and the effects described below are based on the assumption that installation of the new circuit operation would cause a similar amount of disturbance on average as the construction of the new Alternative 1 transmission line. Actual disturbance may be lower than what is projected here, but cannot be accurately estimated at this time.

Post-Project restoration will promote the establishment of native vegetation in areas of ground disturbance. If these efforts are not fully successful and there is an increased amount of invasive species, habitat values for the California spotted owl would decrease. Until native vegetation is recovered, these areas would not provide suitable habitat for the California spotted owl. Oak trees along routes used for construction may require trimming at the time of construction. While actual tree removal is expected to be minimal, if at all necessary, trees may be trimmed and understory would be removed in areas as required for construction. Once native vegetation has reestablished, the area would provide suitable habitat for the California spotted owl. However, this vegetation would require several years to reach the conditions necessary for nesting spotted owls.

The Project may impact the hydrology of intermittent streams where Project vehicles may pass directly through streambeds to access tower locations. It is expected that one RCA on the ANF may be affected by construction. There are numerous other streambed crossings outside of the forest, such as in Charlie Canyon.

Cumulative Impacts

SCE's ATP may cause a cumulative effect to California spotted owls along with BRRTP. Within the ANF, Alternative 1 would be near the ATP only at its southern terminus, just north of the proposed Haskell Canyon Switching Station, a separation of approximately one mile. While the ATP was not expected to have any effect on California spotted owl due to absence of suitable habitat or mitigation that would help avoid impacts to suitable habitat, any project-related effects that did occur to spotted owl habitat, such as conifer stands or oak woodlands, may exert a cumulative effect on this species and its habitat with the BRRTP (Aspen 2006). If nests or breeding spotted owl pairs are found in or near BRRTP construction areas during preconstruction USFS protocol surveys, the limited operating period (LOP) will be applied according to the ANF Land Management Plan (Standard 20 – Part 3). No Project-related activities will be allowed within these dates (February 1 to August 15) or until chicks have fledged. This and other measures will help reduce impacts to the California spotted owl and possibly avoid directly impacting any individuals.

SCE's TRTP may cause a cumulative reduction in California spotted owl habitat along with BRRTP. It is estimated that Alternative 2 of the TRTP will result in 43.1 acres of spotted owl habitat loss and that Alternative 6 of the TRTP will result in 35.7 acres of habitat loss (Aspen 2009). It is estimated that construction of Alternatives 1, 2, 2a, and 3 of the BRRTP would temporarily impact 2.8, 6.2, 5.7, and 0.7 acres and permanently impact 0.9, 1.5, 1.8, and 0.3 acres of California spotted owl habitat, respectively. While these projects are in different halves of the ANF, the mutual habitat loss would reduce forest-wide suitable habitat for this species.

Non-native plant removal and fuel management activities are planned throughout the forest. The emphasis of these treatments is to reduce fuel hazards and non-native plants, and where fuel hazard reduction occurs in coniferous stands around plantations or other areas, this may degrade suitable California spotted owl habitat. The various fuel reduction or fuelbreak projects that have occurred in the past or are proposed for the future at plantations within the ANF, as described above in the cumulative projects list, may reduce spotted owl habitat thinning, pruning, chipping, or burning surrounding vegetation, including coniferous trees or parts of trees (USFS 2009 – 2010). However, these temporary impacts to spotted owl habitat are intended to reduce the potential for stand-replacing wildfires, which have the potential to significantly impact spotted owl habitat.

In April 2009, LADWP conducted unauthorized road grading along City Highline Road, a road that would provide partial access to Alternatives 2, 2a, and the reconductoring corridor. The effects of this grading, such as riparian habitat loss, may cause a cumulative effect on California spotted owls with the BRRTP. Several spotted owl habitat and survey sites were identified within the graded area, and these areas were affected due to the trimming of live oaks during grading. At least ten oaks were trimmed during grading activities, causing a small reduction in the amount of habitat that spotted owls have to nest in. Additional trimming or disturbance in this area as a result of BRRTP's construction would exert a cumulative effect on suitable habitat in this area.

LADWP plans to replace the current interior lining of its Bee Canyon sag pipe in the future. This section of the aqueduct is located approximately 1.5 miles from the end of the graded area referenced above. The project area is immediately adjacent to oak woodland that may provide some suitable habitat for California spotted owl. This area was also selected for a spotted owl survey site. Project activities may cause a small temporary disturbance from construction noise and possible habitat loss if spotted owls are present, but any cumulative effect is likely to be minimal due to the small nature of the Bee Canyon project.

7.5.4 Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest Service FEIS (USFS 2005b, Volume 2, page 78) identifies the tracking of occupied territories and/or habitat conditions by way of the Forest Service Region 5 protocol as an acceptable methodology. The sections below summarize the habitat and population status and trend data for the California spotted owl. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USFS 2008), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  The 1994 Final Report of the Southern California Spotted Owl Biologist Team identified 59 territories on the ANF, of which 48 were in live oak/big cone Douglas fir and 11 were in mixed conifer forests (USFS 2008). However, this information has not been updated since and does not include any newly located territories or territories that are located within ANF boundaries but not on federal lands. It is also unknown if these sites were actual breeding territories or just historic response locations. According to CalVeg, suitable spotted owl habitat on the ANF consists of the following vegetation communities, which in total encompass 142,953 acres, or approximately 21%, of the entire forest (USFS 2008).

TABLE 17. CALIFORNIA SPOTTED OWL CALVEG HABITAT ON THE ANGELES NATIONAL FOREST

	CALVEG TYPE	AMOUNT AVAILABLE ON FOREST
DM	Bigcone Douglas Fir Alliance	41370
EP	Eastside Pine Alliance	9817
MF	Mixed Conifer – Fir Alliance	20266
MP	Mixed Conifer – Pine Alliance	12761
PP	Ponderosa Pine Alliance	620
PD	Gray Pine Alliance	286
PC	Coulter Pine Alliance	4464
NX	Interior Mixed Hardwood Alliance	773
QC	Canyon Live Oak Alliance	49049
QE	White Alder Alliance	1000
QK	Black Oak Alliance	1166
QF	Fremont Cottonwood Alliance	456
QW	Interior Live Oak Alliance	72
QL	Valley Oak Alliance	116
QX	Black Cottonwood Alliance	109
QB	California Bay Alliance	628
	TOTAL	142,953

Aerial surveys are conducted annually to observe woody plant mortality on the four Southern California National Forests. The results of these surveys from 2001 to 2009 can be observed in Table 13. It is expected that suitable California spotted owl habitat will continue to decline over the coming years due to wildfires, drought, and bark beetle infestation (USFS 2008).

- *Population Status and Trend at the Forest Scale*
  Surveys for California spotted owl have been conducted on the ANF sporadically over the last 20 years, unfortunately not producing enough data to detect credible population trends. The results of these surveys from 2005 to 2008 can be observed in Table 14.

7.5.5 Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Areas impacted by Project activities would not initially provide suitable habitat for California spotted owls. However, with successful implementation of restoration efforts, the Project area would be expected to provide suitable spotted owl habitat in the future (more than five years).

The total area impacted by the BRRTP would be small. California spotted owls inhabit mixed conifer and oak woodlands that encompass 21.56% of the ANF. The Project-level habitat impacts would not alter or contribute to the existing forest-wide population trends for the California spotted owl.

8.0 SUMMARY

The linear nature of this Project means that the total area relative to the landscape is such that a significant loss or improvement to MIS populations across the Forest, or even in the Project vicinity, is unlikely. Project completion would work to increase the reliability of electrical energy to the municipality of Los Angeles, while helping LADWP meet the increasing standards for providing renewable energy to its customers.

The Project may benefit mule deer by increasing the vegetative mosaic, thus creating improved forage opportunities. Mountain lions may be positively affected by the potential increase in deer populations due to improved forage. Song sparrows and arroyo toads would likely experience limited effects due to implementation of Best Management Practices and Mitigation Measures and avoidance of the Riparian Conservation Areas and implementation of the Streambed Alteration Agreement. California spotted owls may suffer a slight reduction in habitat if any oaks or coniferous trees are required to be trimmed for placement of towers or stringing of the transmission line. All of these species, however, will be cumulatively impacted by the effects of other past, present, and reasonably foreseeable future actions, and these impacts would increase accordingly with implementation of the BRRTP.

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APPENDIX J: WEED RISK ASSESSMENT

June, 2012

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER

Barren Ridge Renewable Transmission Project
Angeles National Forest Weed Risk Assessment

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Weed Risk Assessment

Barren Ridge Renewable Transmission Project

Angeles National Forest

June 2012

REVIEWED AND
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1.0 INTRODUCTION

The City of Los Angeles Department of Water and Power (LADWP) is proposing to construct the Barren Ridge Renewable Transmission Project (BRRTP or Project) to access clean, renewable resources in the Tehachapi Mountain and Mojave Desert areas, and to improve reliability and upgrade transmission capacity. LADWP, the U.S. Department of Agriculture (USDA) Forest Service (Forest Service) and the U.S. Department of the Interior, Bureau of Land Management (BLM) are preparing a joint Environmental Impact Statement (EIS) / Environmental Impact Report (EIR) for the proposed BRRTP. LADWP is the California Environmental Quality Act (CEQA) Lead Agency, while the Forest Service and BLM are the federal Co-Lead Agencies under the National Environmental Policy Act (NEPA).

The USDA Forest Service Strategic Plan for Fiscal Years 2007 through 2012 identifies the introduction and spread of invasive species as one of the four primary threats to the nation's forests and grasslands (USFS 2007). Some of the goals stated within the Strategic Plan are to "restore, sustain, and enhance the nation's forests and grasslands," and to "reduce adverse impacts from invasive and native species, pests, and diseases" using a 2002 baseline and 2012 target of 90% restoration and/or protection from invasive species (USFS 2007). Several federal laws and regulations require the Forest Service to manage and control noxious weeds on Forest Service lands. Among these are the Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), and NEPA (42 U.S.C. 4321-4346) and implementing regulations found at 40 Code of Federal Regulations (CFR) Parts 1500-1508 (FSM 1950; FSH 1909.15). Forest Service Manual 2080 (FSM 2080), which governs the management of noxious weed on Forest Service lands, describes these laws and additional regulations in Section 1 (USFS 1995). In addition, the land management plan for each national forest or forest region, such as the Final EIS, Volume 1, Land Management Plans (USFS 2005), contains policies and guidelines for the prevention and control of invasive species. Plans and guidelines for the control of noxious weeds in the Pacific Southwest Region can also be found in that region's Noxious Weed Management Strategy (USFS 2000). One of the requirements of FSM 2080 is "when any ground disturbing action or activity is proposed, determine the risk of introducing or spreading noxious weeds associated with the proposed action," and further, to "determine the factors that favor the establishment and spread of noxious weeds and design management practices or prescriptions to reduce the risk of infestation or spread of noxious weeds" (USFS 1995).

To comply with FSM 2080, this report 1) analyzes the risk of noxious weed introduction or spread associated with the BRRTP within the Angeles National Forest (ANF; Forest); and 2) identifies appropriate methodology, impact reduction strategies, mitigation measures, and General Practices (GPs) to reduce these risks. This report documents the known presence of noxious weeds along access roads within the Project area and helps to provide guidance for reducing their spread as related to the construction and operation of the BRRTP.

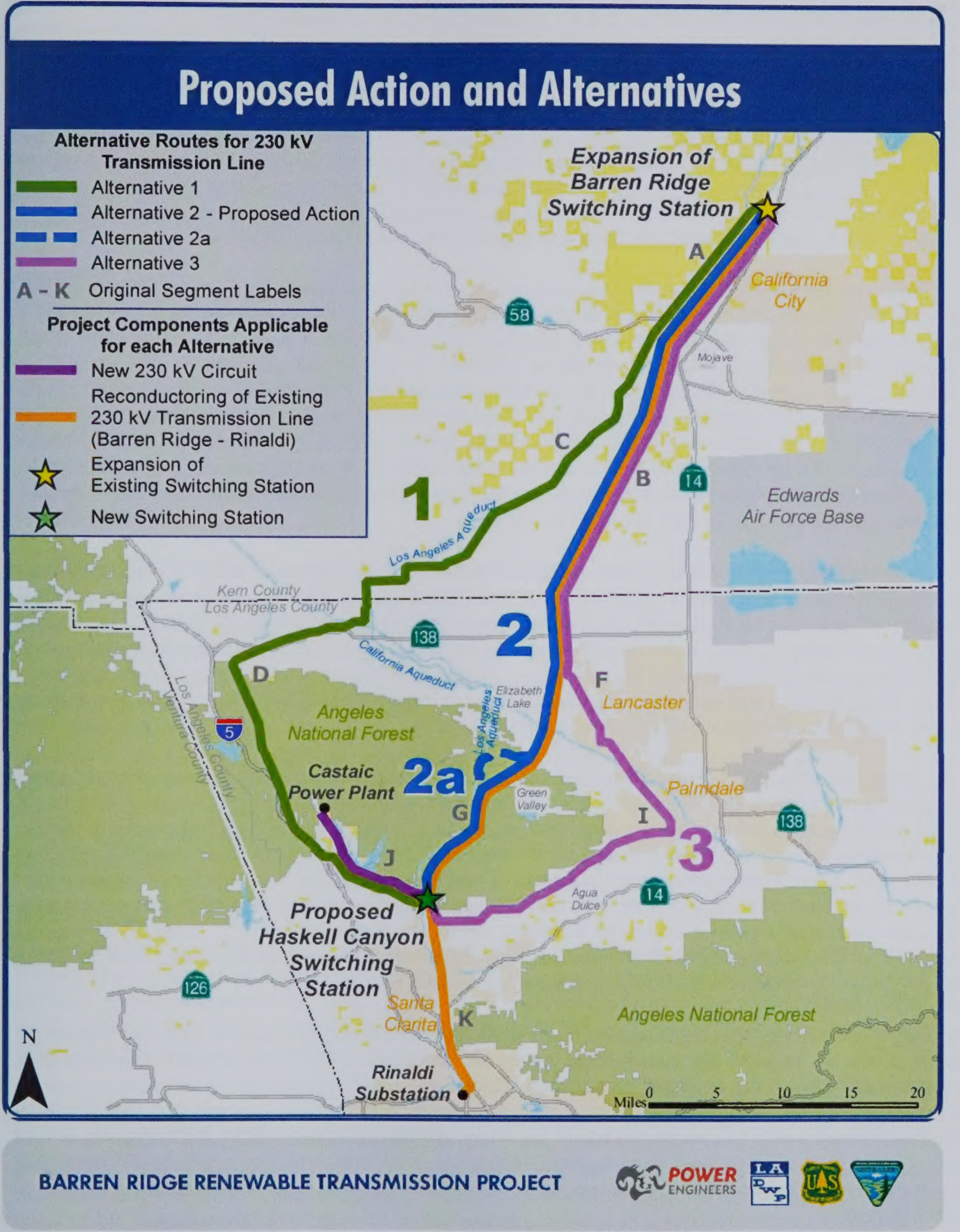
1.1 PROJECT DESCRIPTION

The Project is located in Kern and Los Angeles counties. As proposed by LADWP, it would be 76 miles in length, extending from the Barren Ridge Switching Station to Rinaldi Substation, and extending approximately 12 miles from the Castaic Power Plant to the proposed Haskell Canyon Switching Station. As shown in Figure 1, the proposed BRRTP would include the following:

- Construction of 61 miles of a new 230 kilovolt (kV) double-circuit transmission line from the LADWP Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station. This proposed line would cross 13 miles of National Forest System lands and four miles of public lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM);

- Construction of 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant. This line would cross four miles of National Forest System lands and less than one mile of public lands managed by the BLM;
- Reconductoring of 76 miles of the existing Barren Ridge – Rinaldi (BR-RIN) 230 kV transmission line with larger-capacity conductors between the Barren Ridge Switching Station and the Rinaldi Substation. Thirteen miles of National Forest System lands and four miles of public lands managed by the BLM would be crossed by the reconductoring;
- Construction of a new switching station in Haskell Canyon on LADWP-owned property located north of Santa Clarita and just south of the ANF-managed lands;
- Expansion of the existing Barren Ridge Switching Station.

FIGURE 1. PROPOSED ACTION AND ALTERNATIVES.


Proposed Action and Alternatives
Alternative Routes for 230 kV Transmission Line
Alternative 1
Alternative 2 - Proposed Action
Alternative 2a
Alternative 3
A - K Original Segment Labels
Project Components Applicable for each Alternative
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
A
B
C
D
F
G
I
J
K
1
2
2a
3
California City
Mojave
Edwards Air Force Base
58
14
138
5
126
Los Angeles Aqueduct
Kern County
Los Angeles County
California Aqueduct
Elizabeth Lake
Los Angeles County
Ventura County
Angeles National Forest
Castaic Power Plant
Lancaster
Palmdale
Green Valley
Agua Dulce
Proposed Haskell Canyon Switching Station
Santa Clarita
Rinaldi Substation
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BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

1.1.1 Project Component Descriptions

Component 1 - Construction of New 230 kV Double-Circuit Transmission Line

The proposed new double-circuit 230 kV transmission line would consist of two Alternating Current (AC) lines from the Barren Ridge Switching Station to the new Haskell Canyon Switching Station. The proposed structures for the transmission line are self-supporting double-circuit steel lattice towers fabricated from unpainted galvanized steel members. Depending on the topography of the surrounding terrain, the height of the lattice structures would range from approximately 100 to 195 feet, with a typical span of 1,000 to 1,100 feet. Exact structure placement would be determined during engineering surveys and detailed design studies. A variety of engineering, constructability, existing access, and environmental issues are considered during structure siting within permitted rights-of-way (ROWs).

LADWP proposes to utilize self-supporting steel lattice structures and tubular steel poles (TSPs) requiring concrete foundations. The steel lattice structures would require four footings (one for each leg) and TSPs require single footings. All footings would be steel-reinforced concrete piers and cast in place. Each concrete footing for lattice structures would be between 2.5 and 5.0 feet in diameter with an average depth of 20 feet depending on soil conditions. The foundations for TSPs would consist of augured holes approximately five to seven feet in diameter and 15 to 30 feet deep, depending on conditions. Formwork and galvanized steel reinforcing would be assembled in the hole prior to casting concrete in place. Reinforcing steel would become integral to the lower leg of the steel lattice structure during assembly and installation. An above-ground concrete form placed over each hole would result in a final concrete foundation height of 0.5 to 2.0 feet above ground level.

The proposed new double-circuit 230 kV transmission line and installation of the new proposed circuit upgrades on existing structures is a bundled 715.5 kcmil “Starling” ACSS/AW (aluminum conductor steel supported/aluminum-clad steel wire). Each circuit would consist of three phases (or “wires”). To increase the current-carrying capacity of the transmission lines and reduce power loss, the proposed Project would utilize bundled conductors installed for each phase. Bundled conductors consist of two or more conductor cables connected by a non-conducting spacer. The new double-circuit 230 kV transmission line utilizing double-bundled conductors would consist of a total of 12 wires.

Minimum conductor height above the ground, under normal operation, is 31 feet. Greater clearances may be required in certain areas. Minimum conductor clearance would dictate the exact height of each tower based on topography, safety clearance requirements, land use, tower spacing, temperature, wind loading, and electromagnetic field potential. Insulators are used to provide the physical connection of conductors to structures. These system components are made of very low conducting materials (polymer insulators) that inhibit the flow of electric current from energized conductors to ground or to other energized system elements. Insulators and their associated hardware are to be configured in an “I” assembly to support conductors while maintaining required distances between phases and grounded structures. Each “I” string would consist of six-inch diameter insulators between six and eight feet long.

Existing paved and unpaved highways and roads would be used for access whenever possible. Where new access roads are required for construction, operation, or maintenance of the Project, they would be constructed to support the weight of construction vehicles and would typically be 16 feet wide, consisting of a 12- to 14-foot driving surface with a side drainage system between one and two feet in width. Permanent roads would be constructed where necessary, or where it is required by the landowner or land managing agency. On National Forest System (NFS) lands, approved herbicides would be utilized within the Project area on select invasive plant species. Invasive plant surveys/control would continue for the life of the Project.

BLM, USFS, and LADWP identified the four Alternatives below to be carried forward and analyzed in the EIS/EIR, along with the No Action Alternative; they are illustrated in Figure 2-11. All alternatives were evlauted in the biological evaluation.

No Action Alternative

The No Action Alternative is required by NEPA and CEQA. Under the No Action Alternative, the construction of the new 230 kV transmission line, addition of a new circuit on existing structures from Haskell Canyon to the Castaic Power Plant, reconductoring of the existing Barren Ridge to Rinaldi (BR-RIN) 230 kV transmission line, construction of a Haskell Canyon Switching Station, and expansion of the existing Barren Ridge Switching Station would not occur.

Alternative 1

The new 230 kV transmission line for Alternative 1 would be 83 miles long and run from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station, and is the westernmost alternative. The addition of 12 miles of a new 230 kV circuit from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would parallel the new 230 kV transmission line for eight miles. Reconductoring of 76 miles of the existing BR-RIN 230 kV transmission line would occur in a separate utility corridor. Alternative 1 has the potential to impact portions of unincorporated Kern and Los Angeles Counties; the communities of Holiday Valley Estates, Castaic, and Saugus; and Cities of Mojave, Santa Clarita, and Los Angeles. Eight and a half miles of the new transmission line would be constructed by helicopter.

Alternative 2 (LADWP's Proposed Action and Federal Agency Preferred Alternative)

The new 230 kV transmission line for Alternative 2 would be 61 miles long, and run from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station, paralleling LADWP's existing BR-RIN 230 kV transmission line for the entire length. The existing BR-RIN would be reconductored as part of the Project and, for approximately 1.5 miles, the two new 230 kV circuits would be placed on existing four-circuit structures that are located just north of the proposed Haskell Canyon Switching Station (see Figure 2-3). Impacts would be concentrated along this utility corridor and have the potential to affect portions of unincorporated Kern and Los Angeles Counties; the communities of Willow Springs, Antelope Acres, Elizabeth Lake, Green Valley, and Saugus; and Cities of Mojave, Santa Clarita, and Los Angeles. The addition of a new 230 kV circuit from the Castaic Power Plant to the proposed Haskell Canyon Switching Station would occur in a separate utility corridor from that of the new 230 kV transmission line.

Alternative 2a

Alternative 2a's new 230 kV transmission line from Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station would be 63 miles long, and very similar to Alternative 2. They share the same proposed alignment for 56 miles, but seven miles would be re-routed around Green Valley and would create a new utility corridor through the Angeles National Forest. The same communities as Alternative 2 would be potentially impacted.

Alternative 3

The new 230 kV transmission line for Alternative 3 would be 76 miles long and is the easternmost alternative. Approximately 38 miles of Alternative 3's northern alignment would parallel the reconductoring of BR-RIN, and impacts would be concentrated within the same corridor. Thirty-four miles of the southern portion of the Alternative would be placed in a separate utility corridor from the reconductoring; 11 miles of Alternative 3 would not be within an existing LADWP corridor. The installation of a new 230 kV transmission circuit would be placed on existing structures and not share a corridor with the new double-circuit 230 kV transmission line from Barren Ridge Switching Station. Alternative 3 has the potential to impact portions of unincorporated Kern and Los Angeles Counties; communities of Willow Springs, Leona Valley, Antelope Acres, Agua Dulce, Castaic and Saugus; and Cities of Mojave, Lancaster, Palmdale, Santa Clarita, and Los Angeles. Of all the Alternatives, this Alternative would have the potential to impact the most areas since the three Project components would be located in three separate areas.

Component 2 - Addition of New 230 kV Circuit

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV transmission line structures. Approximately 300 feet of BLM-managed public lands and four miles of NFS lands would be traversed. This new circuit would be called Castaic – Haskell Canyon #4 and would utilize the same conductor (bundled 715.5 kcmil "Starling" ACSS/AW) as that proposed for the new 230 kV transmission line.

The addition of a new circuit on existing tower structures would require many of the same construction activities associated with a new transmission line. However, all work would be within existing ROWs and no new towers would be constructed. Some towers may need to be modified or reinforced to carry the additional weight of the new conductor.

Component 3 - Reconductoring of Existing Transmission Line

LADWP proposes the reconductoring of approximately 75 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station to Rinaldi Substation (towers 176-1 through 251-1). The existing conductors (954/ 2,312 kcmil) would be replaced with a new 1,433.6 kcmil "Merrimack" ACSS/TW/HS conductor (aluminum conductor steel supported/trapezoidal wires/high strength).

The upgrade of the existing BR-RIN would also require many of the same activities of the new transmission line (surveying of ROW, rehabilitation of existing access and spur roads, clearing of ROW, conductor installation, ground rod installation, and cleanup). The existing conductor would be removed using a pulling line, and replaced with the new conductor. All work would be restricted to within the existing ROW, and no additional ROW would be required. Some of the towers would need to be modified, replaced, and/or foundations reinforced/replaced to carry the additional weight of the new heavier conductor as determined by engineering studies.

Component 4 - Construction of New Switching Station

LADWP proposes the construction of a new switching station in Haskell Canyon, located south of the ANF on LADWP-owned property. The proposed location is at the convergence of several existing and proposed 230 kV transmission lines including the existing BR-RIN, the proposed Barren Ridge – Haskell Canyon, existing Castaic – Northridge, Castaic – Sylmar, Castaic – Olive, and the proposed Castaic – Haskell Canyon.

The station would be approximately 400 feet by 600 feet to accommodate the necessary equipment such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be approximately 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road approximately 16 feet wide, and would be enclosed by chain-link fencing with barbed-wire extension for security.

Multiple transmission lines will terminate within the switching station (e.g., the new and existing Barren Ridge – Haskell and Castaic – Haskell Canyon transmission lines) and would require the installation of galvanized steel structures. High-voltage bus work consisting of aluminum jumpers and tubing would be installed.

Component 5 - Expansion of Existing Switching Station

LADWP proposes expansion of the existing Barren Ridge Switching Station to the east for an area of 235 feet by 500 feet, which would increase the total station size to 485 feet by 500 feet (approximately 5.6 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and drainage area.

Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

It is estimated that approximately 700 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 80 trips to the site by 40-ton, 10-yard capacity concrete trucks over an approximate 45-day working period. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, concrete trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks and mechanic trucks would also be required. An estimated eight months with approximately 60 workers would be required to expand the station.

1.1.2 Construction Activities

This section briefly describes the construction activities associated with the Project The general sequence of transmission line construction includes: surveying and staking the centerline; construction of access roads; ROW clearing; installation of foundations; tower assembling and installation; conductor installation; ground rod installation, and site cleanup and reclamation. The ROW and preliminary design features are briefly summarized below. A general sequence for substation improvements is not included in this section as substation construction activities are site-specific.

Surveying Activities

The LADWP must first obtain survey permits for the portion of the Project crossing federal lands managed by the Forest Service and the BLM, and rights-of-entry for private lands. This would include the issuance of a 50-year term Special Use Permit to LADWP by the Forest Service and a Right-of-Way Grant issued by the BLM. For survey on affected private lands, LADWP would need to negotiate rights-of-entry with the local landowners. Once survey permits are obtained, construction survey work would consist of locating the centerline, tower center hubs, ROW boundaries, and tower access roads. All of these activities would begin approximately one year prior to the start of construction. Cultural resources and threatened and endangered species intensive surveys would begin once the survey of the centerline and access roads is completed and clearly marked.

Construction of Access Roads

The construction, operation, and maintenance of the proposed transmission line would require that heavy vehicles access tower sites along the ROW. All new access roads would be constructed to support the weight of these vehicles and would typically be 16 feet wide, consisting of a 12- to 14-foot driving surface with a side drainage system between one and two feet in width. Road standards would be addressed specifically in the Construction, Operation, and Maintenance Plan (COM Plan) and the Plan of

Development (POD) during the engineering phase of the Project, and prior to a Notice to Proceed from the Forest Service and BLM.

Existing paved and unpaved highways and roads would be used where possible. Roads along existing utility corridors would also be used where possible to minimize new access road construction. In locations where existing roads could be used, that are located in close proximity to the proposed or existing ROW centerlines, only new spur roads to the tower sites would be constructed. The specific locations and design of all new access and spur roads would be determined during final Project design. Table 1 lists the estimated ground disturbance of access and spurs roads based on terrain.

Table 1. BRRTP Ground Disturbance Estimates of Access and Spur Roads Based on Terrain

Ground Disturbance Categories	Access Roads			Spur Roads (average width 16 feet)	
	Average Width (feet)	Average Miles of Roads Per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line*	Average Miles of Roads per Mile of Transmission Line	Average Acres of Disturbance Per Mile of Transmission Line
1. Existing roads or agricultural land; no widening anticipated	16	n/a	n/a	0.3	0.6
2. Existing 8 ft wide roads that require an additional 8 ft of widening	16	1.0 to 2.5	Permanent 0.9 to 2.4	0.3	0.6
3. Construct new road on flat terrain (0-10%)	16	1.0 to 2.5	Permanent 1.9 to 4.8	0.3	0.6
4. Construct new road on sloping terrain (10-20%)	24*	2.5 to 4.0	Temporary 7.3 to 11.6 Permanent 4.8 to 7.7	0.5	1.0
5. Construct new road on steep terrain (20-30%)	48*	4.0 to 6.0	Temporary 23.3 to 34.9 Permanent 7.7 to 11.6	0.8	1.6
6. Construct road on very steep terrain (greater than 30%)	96*	6.0 to 8.0	Temporary 69.8 to 93.1 Permanent 11.6 to 15.5	1.0	1.9

*Categories 4 through 6 access roads would be re-vegetated back to 16 feet wide after construction of the transmission line.

Wherever possible, roads would be built at right angles to streams and washes. Culverts or other drainage structures would be installed as necessary across stream and washes but the roads would usually follow the natural grade. In addition, road construction would include dust control and erosion control measures in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line. Gates would be installed where required at fenced property lines to restrict general vehicular access from or to the ROW. Where identified within the environmental studies for mitigation purposes, access roads may be excluded or limited within specific sensitive areas, such as Riparian Conservation Areas (RCAs) on the ANF.

Clearing Right-of-Way

The clearing of some natural vegetation may be required. However, selective clearing would be performed only when necessary to provide for surveying, electrical safety clearances, line reliability, and maintenance. Topping or removal of mature vegetation, under or near the conductors, would be done to provide adequate electrical clearance as required by the National Electrical Safety Code, the North American Electrical Reliability Corporation, and California Public Utilities Commission General Order 95 standards.

Trees that could fall onto the lines or affect lines during wind-induced line swing would be removed. Normal clearing procedures are to top or remove large trees and not disturb smaller trees. Where there is a direct conflict between trees and clearance standards, the removal of trees would be jointly reviewed and agreed upon between LADWP and the owners or managers of the property. Rights-of-way would not be chemically treated unless necessary to comply with requirements of a permitting agency. On NFS lands, approved herbicides would be utilized within the Project area on select invasive plant species. Invasive plant surveys and control would continue for ten years or until the success criteria is met.

Tower Site Clearing

After access roads are developed, preparation of individual structure sites would be required prior to installation of the structures. At each tower site, leveled areas (pads) would be needed to facilitate the safe operation of equipment such as construction cranes, vehicles, and materials, and to assemble and install towers. At each tower site, a temporary work area of approximately 200 feet square in flat terrain and 200 by 250 feet in areas with slopes greater than eight percent would be needed. However, many tower sites would be considerably smaller depending on the size of the tower, the terrain, and biological resource considerations, among other factors. The work area would be required for the location of tower footings, assembly of the tower, and the necessary crane maneuvers. Vegetation would be cleared or herbaceous vegetation would be crushed only when necessary. After line construction, all pads not needed for normal transmission line maintenance would be restored to previous contours to the extent feasible and revegetated where required by a permitting agency.

Staging Areas and Batch Plants

It is anticipated that several construction yards or staging areas would be required for materials storage, construction equipment, construction vehicles, and temporary construction offices. Staging areas would be approximately five acres in size, and located near each end of the transmission line and at various locations approximately every 15 miles along the proposed line route. Some staging areas may need to be graded; however, vegetation would be crushed in most cases and not bladed. The LADWP would negotiate with landowners for specific locations of the staging areas.

Concrete for use in constructing foundations would be dispensed from a portable concrete batch plant located at approximately 15 mile intervals along the proposed line route. A rubber-tired flatbed truck and tractor would be used to relocate each plant along the ROW. Commercial ready-mix concrete would be used when access to tower construction sites is economically feasible.

The construction yards and batch plants would serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, and stations for equipment maintenance. Facilities would be fenced and their gates locked. Security guards would be stationed where needed. Table 2 lists the estimated disturbance for the various staging sites.

TABLE 2. BRRTP ESTIMATED TEMPORARY DISTURBANCE FOR STAGING SITES

Disturbance Description	Categories 1 through 3 Flat (0 – 10% slope)		Categories 4 through 6 Mountainous (10 – 30% slope)	
	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance
Structures	200 x 200 ft. per structure (0.9 acre per structure)	4.6 acres per mile	200 x 250 ft. per structure (1.2 acres per structure)	5.8 acres per mile
Pulling and tensioning sites	200 x 500 ft (2.3 acres) One site every 2.5 miles	0.9 acre per mile	200 x 500 ft (2.3 acres) One site every 2 miles	1.2 acres per mile

Disturbance Description	Categories 1 through 3 Flat (0 – 10% slope)		Categories 4 through 6 Mountainous (10 – 30% slope)	
	Estimated Disturbance Dimension	Average Disturbance	Estimated Disturbance Dimension	Average Disturbance
Sleeving and miscellaneous stringing operations	100 x 200 ft. (0.5 acre) One site every 2.5 miles	0.2 acre per mile	100 x 200 ft (0.5 acre) One site every 2 miles	0.2 acres per mile
Guard structures at major crossings	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acre per mile	200 x 300 ft. (1.4 acres) One crossing every 5 miles	0.3 acres per mile
Material staging sites	400 x 540 ft. (5 acres) One site every 15 miles	0.3 acre per mile	N/A	N/A
Concrete batch plants (maximum of 3)	5 acres, 30 mile haul distance	0.2 acre per mile	N/A	N/A
Total Temporary Disturbances	**6.5 acres per mile**		**7.5 acres per mile**	

Foundation Installation

Tower foundations for the lattice structures would consist of drilled concrete piers. The foundation process would start with the boring of four holes for each lattice structure. The holes would be bored using truck-mounted excavators with various diameter augers to match diameter and depth requirements of the foundation sizes.

For a typical suspension lattice tower, each hole would typically be 2.5 feet in diameter and 20 feet deep, depending on soil conditions. For the larger angle or dead-end structures, wider and deeper foundation holes may be required up to five feet in diameter and 30 or more feet deep, depending on soil conditions. Each foundation would extend above the ground line between six inches and four feet. In extremely sandy soils, soil stabilization by water or a gelling agent may be used during excavation.

Following excavation of the foundation holes, formwork and reinforcing steel would be installed and concrete would be placed. Reinforcing steel cages would be assembled at laydown yards and delivered to each structure location by flatbed truck. The pre-cast footing would be lowered into the excavated foundation hole, positioned, and backfilled. The cast-in-place footing would be installed by placing reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material would be used for fill where suitable. The foundation excavation and installation would require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks. Typical suspension structures would require approximately 25 to 40 cubic yards of concrete and dead-end structures would require approximately 120 cubic yards of concrete.

Tower Assembly and Installation

The size of framing pads for each structure (assembly sites) would be approximately 40,000 square feet. The location of these sites has not yet been determined, but exact locations would be identified within the COM Plan and POD prior to a Notice to Proceed from the agencies. Lattice towers would be assembled at each site, installed and bolted to the foundations. Bundles of steel members and associated hardware would be transported to each tower site by truck. Steel members would be assembled into subsections of convenient size and weight on the ground. Assembly would be facilitated with a small rough-terrain crane. The assembled subsections would be hoisted into place by a large crane and then fastened together to form a complete tower.

Conductor Installation

After the towers are installed, insulators, hardware, and stringing sheaves would be delivered to each tower site. The towers would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position. Sheaves are rollers that are temporarily attached to the lower end of the insulators to allow the conductor to be pulled, or "strung," along the line.

Pilot lines would be pulled (strung) from tower to tower by a helicopter and threaded through the stringing sheaves at each tower. Following pilot lines, a larger-diameter, stronger line (pulling line) would be attached to conductors to pull them onto towers. This process would be repeated until the ground wire or conductor is pulled through all sheaves. Ground wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. Sites for tensioning equipment and pulling equipment would be approximately 2.5 miles apart.

The tensioning and pulling sites would be approximately 200 feet by 500 feet. To the greatest extent practical, pulling and tensioning sites would be located within the transmission ROW. However, some pulling and tensioning sites may occur outside the ROW. Depending on topography, some grading may be required at pulling and tensioning sites to create level pads for equipment. Tensioners, line trucks, wire trailers, and tractors needed for stringing and anchoring the ground wire or conductor would be located at the tensioning sites. A puller, line trucks, and tractors needed for pulling and temporarily anchoring the counterpoise/ground wire and conductor would be located at the pulling sites. After installing the conductor and fiber optic shield wire, sagging, clipping and dead-ending activities would be performed. This process would involve adjusting tension of the conductors and shield wires, removing stringing sheaves, and permanently attaching the conductor to the insulators with specialized hardware.

Ground Rod Installation

Part of standard construction practice prior to wire installation would involve measuring the resistance of tower footings. If the resistance to remote earth for each transmission tower is greater than 10 ohms, counterpoise (grounds) would be installed to lower the resistance to 10 ohms or less. Counterpoise would consist of a bare copper-clad or galvanized steel cable buried a minimum of 12 inches deep, extending horizontally from one or more tower legs for approximately 200 feet.

Switching Station Installation

Construction of the new Haskell Canyon Switching Station would consist of preconstruction surveys, clearing and grading of access roads, site grading and drainage development, installation of concrete foundations and steel support structures, installation of below- and above-ground electrical conduits for equipment power and control, installation of below- and above-grade grounding conductors, and installation of control and relay houses. Equipment required for station construction would include graders and excavators, backhoes, drill rigs, concrete trucks, trucks and flatbed trailers. Cranes, man-lifts, portable welding units, line trucks and mechanic trucks would also be required. Construction of the switching station would require an estimated 12 months with approximately 60 workers.

Site preparation work for the station would involve clearing and grading of access roads, clearing of the switchyard site, the cut-and-fill grading of the site, and placement and compaction of structural fill that would serve as a base for switching station facilities. The site would be graded to maintain current drainage patterns as much as possible. An approximately 16 foot wide paved road and 100 foot by 100 foot gravel parking area would be required for worker access and parking. The yard would be covered with crushed-rock aggregate. Native vegetation would be re-established where possible outside the switchyard fence.

Following site grading and development, reinforced concrete foundations would be installed to support the steel structures and electrical equipment and control facilities. It is estimated that approximately 1,500 cubic yards of concrete would need to be delivered to the switching station site for the foundations. Foundation work would require approximately 180 trips to the site by 40-ton, 10-yard capacity concrete trucks over an approximate 60-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station grounding mat.

Cleanup

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the line. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. No open burning of construction trash would occur without agency approval. Microtrash would be cleaned from all work areas within known California condor habitat. *Microtrash* is a term used to describe small bits of debris like bottle caps, rags, screws, bolts, wires, glass, and other refuse materials found in condor habitat.

Hazardous Materials within Corridor

Petroleum products, such as gasoline, diesel fuel, helicopter fuel, crankcase oil, lubricants, and cleaning solvents, would be present within the transmission line corridor during construction. These products would be used to fuel, lubricate, and clean vehicles and equipment. These products would be containerized by fuel trucks or approved containers. When not in use, hazardous materials would be properly stored to prevent drainage or accidents.

Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, would be removed to a disposal facility authorized to accept such materials. All construction, operation, and maintenance activities would comply with all applicable federal, State, and local laws and regulations regarding the use of hazardous substances. The construction or maintenance crew foreman would ensure that all applicable laws are obeyed. In addition, an on-site inspector would be present during construction to make sure that all hazardous materials are used and stored properly. A health and safety plan would be developed as part of the COM Plan and POD during the engineering and preconstruction phase of the Project.

Site Reclamation

The ROW would be restored as required by the property owner or land management agency. All practical means would be used to restore the land to its original contour and to restore natural drainage patterns along the ROW. Because revegetation would be difficult in many areas of the Project where precipitation is minimal, it is important to minimize the area of disturbance during construction. All practical means would be used to increase the chances of vegetation reestablishment in disturbed areas. The total construction period would be approximately two years. The COM Plan, which would be completed during the engineering and preconstruction phase of the Project, would address specific site reclamation of all disturbed areas.

Fire Protection

A Fire Management Plan would be developed for the Project, and all applicable fire laws and regulations would be observed during the construction period. All personnel would be advised of their responsibilities under the applicable fire laws and regulations, including taking practical measures to report and suppress fires.

Construction Monitoring

An approved compliance program would be developed to address mitigation requirements associated with the avoidance of sensitive plant and animal species, cultural sites, or other sensitive features located within or adjacent to the Project. Resource protection measures proposed by LADWP for this Project are described in the Section 4.5. These measures will be included in the POD.

1.1.3 Operation and Maintenance Activities

The nominal voltage for the BRRTP transmission line would be 230 kV AC. There may be minor variations of up to five percent above the nominal level depending upon load flow. Regular inspection and maintenance of overhead facilities is crucial for maintaining uniform, adequate, safe and reliable service. The 230 kV transmission line would be inspected five times annually, by two air patrols and three ground patrols. Maintenance would be performed as needed. When access would be required for non-emergency maintenance and repairs, LADWP would adhere to the same precautions and procedures that were taken during the original construction.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged equipment or infrastructures. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance. Restoration procedures following completion of repair work would be similar to those prescribed for normal construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Details would be provided in the COM Plan and POD.

Vegetation Management

Vegetation management along the transmission line ROW is required by the North American Electrical Reliability Council (NERC), and regular inspection and maintenance of overhead transmission lines is crucial for maintaining uniform, adequate, safe and reliable service. In compliance with the NERC's Standard FAC-003-l, LADWP will prepare a Vegetation Management Plan for the BRRTP. Vegetation management would consist of routine tree trimming to maintain the required minimum ten-foot clearance from conductors to vegetation (California Public Resources Code (PRC) 4293)); clearing flammable brush vegetation within a ten-foot radius around the base of transmission line towers in accordance with California PRC 4292; and clearing brush and trees adjacent to off-highway vehicle trails and access roads to permit adequate access to the facilities.

Access Road Maintenance

Access road maintenance consists of those activities necessary to allow continued access to the ROW and/or each tower structure. These activities may include grading, and maintenance of drainage systems, bridges, culverts, fences, gates and signs. Motor graders, backhoes, dump trucks and pickups are used to maintain access roads.

Permitted Uses

After the transmission line has been energized, land uses that are compatible with safety regulations (such as agriculture and grazing) would be permitted in and adjacent to the ROW. Incompatible land uses within the ROW include construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities. Land uses on public lands that comply with local regulations would be permitted adjacent to the ROW, but would require approval from the appropriate agency. Permission to use the ROW on private lands would have to be obtained by LADWP.

Safety

Safety is a primary concern in the design of the 230 kV transmission line. The AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the substation would be grounded. All fences, metal gates, pipelines, and other metal components that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside of the ROW may also occur.

Abandonment

At the end of the useful life of the proposed Project, if the facility were no longer required, the transmission line would be abandoned. Subsequently, conductors, insulators, and hardware would be dismantled and removed from the ROW. Tower structures would be removed and foundations broken off below ground surface.

If the line and associated ROW are abandoned at some future date, the ROW would be available for the same uses that existed prior to construction of the Project. Following abandonment and removal of the transmission line from the ROW, any areas disturbed to dismantle the line would be restored and rehabilitated to the extent possible.

1.2 GENERAL PRACTICES AND MITIGATION MEASURES

The following tables describe some of the proposed General Practices (GPs) and mitigation measures to reduce the spread of noxious weeds or protect native vegetation during the construction of the BRRTP. These were written by LADWP and apply to preconstruction, construction, and post-construction aspects of the Project. The GPs are considered to be part of the Project description for any Alternative that is chosen. The GPs were written for all resources of the Project. Because not all of these are applicable to biology or to vegetation management, ones that do not apply to biology or vegetation have been removed and show "*not applicable*" in the table below. The entire list can be viewed in the BRRTP Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) (USFS, BLM, and LADWP 2011).

TABLE 3. GENERAL PRACTICES

Plans	
GP-1	**Plan of Development & Construction, Operation and Maintenance Plans.** In consultation with the Forest Service and BLM Authorizing Officers prior to construction, LADWP shall develop a Construction, Operation and Maintenance Plan (COM Plan) with the Forest Service and Plan of Development (POD) with BLM. These plans shall be attached to and become a part of the Special Use and Right-of-Way Authorizations. The COM Plan and POD shall include, at a minimum, road maintenance specifications, vegetation treatment and rehabilitation specifications, and conditions on maintenance and replacement of improvements. The agencies may combine the POD and COM plans into a single document for the Project.
GP-2	*Not applicable*
GP-3	*Not applicable*
GP-4	*Not applicable*
GP-5	*Not applicable*
GP-6	*Not applicable*
GP-7	*Not applicable*
GP-8	*Not applicable*
GP-9	*Not applicable*
GP-10	*Not applicable*

GP-11	*Not applicable*
GP-12	*Not applicable*
Construction Vehicles/Equipment	
GP-13	*Not applicable*
GP-14	*Not applicable*
GP-15	*Not applicable*
GP-16	*Not applicable*
GP-17	*Not applicable*
GP-18	*Not applicable*
GP-19	*Not applicable*
GP-20	*Not applicable*
GP-21	*Not applicable*
GP-22	*Not applicable*
Access Roads	
GP-23	*Not applicable*
GP-24	To the extent practical, any re-grading of access roads shall be the minimum necessary to provide safe access of construction equipment, and erosion control measures.
GP-25	Construction vehicles shall use paved roads to access the construction site when available.
GP-26	*Not applicable*
GP-27	*Not applicable*
GP-28	*Not applicable*
GP-29	*Not applicable*
GP-30	*Not applicable*
GP-31	*Not applicable*
GP-32	*Not applicable*
GP-33	In areas where soils and vegetation are particularly sensitive to disturbance, existing access roads would be repaired only in areas where they are otherwise impassable or unsafe.
Construction Areas	
GP-34	*Not applicable*
GP-35	Grading areas shall be clearly marked and no equipment or vehicles shall disturb slopes or drainages outside of the grading area.
GP-36	*Not applicable*
GP-37	In construction areas (e.g., marshalling yards, tower sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration shall occur as required by the landowner or land management agency. The method of restoration will normally consist of returning disturbed areas back to their natural contour, reseeding, installing cross drains for erosion control as necessary, placing water bars in the road as necessary, and filling ditches.
GP-38	*Not applicable*
GP-39	*Not applicable*
GP-40	*Not applicable*
GP-41	Allow natural vegetation to reoccur on temporarily disturbed areas following the completion of construction.
GP-42	Weed control measures on non-federal lands shall be implemented as determined in consultation with CDFG and the Counties of Los Angeles and Kern Agricultural Commissions.
GP-43	Every effort will be made to minimize vegetation removal and permanent loss at construction sites. Native vegetation will be flagged for protection or stockpiled for recontouring use at the discretion of the Biological Monitor and the Construction Supervisor.
GP-44	In construction areas where recontouring is not required, vegetation will be left in place wherever possible and the original contour will be maintained to avoid excessive root damage and allow for resprouting. Disturbance will be limited to overland driving where feasible to minimize changes in the original contours.
GP-45	*Not applicable*
GP-46	*Not applicable*
GP-47	*Not applicable*

Surveys/Monitoring	
GP-48	Biological Monitor. For areas identified as environmentally sensitive, such as streams, wetlands, riparian areas, and other environmentally sensitive areas, a biological monitor shall be present during ground disturbing construction activities. The qualified biologist shall conduct monitoring for any area subject to disturbance from construction activities that may impact biological resources. The biological monitor's duties include minimizing impacts to special-status species, native vegetation, wildlife habitat, and unique resources, as well as to identify potential issues or impacts to biological resources and report those to the authorized biologist. Where appropriate, the monitor will flag the boundaries of biologically sensitive areas and monitor any construction activities in these areas to ensure that ground disturbance activities and impacts occur within designated limits.
GP-49	Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) will be implemented to educate all construction personnel of the area's environmental conditions and the environmental protection measures that must be adhered to. An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, protection of biological and cultural resources, and proper Best Management Practice (BMP) implementation, to all construction and maintenance personnel.
Coordination/Permits	
GP-50	*Not applicable*
GP-51	*Not applicable*
GP-52	*Not applicable*
GP-53	*Not applicable*
GP-54	*Not applicable*
GP-55	*Not applicable*
GP-56	*Not applicable*
GP-57	*Not applicable*
GP-58	*Not applicable*
GP-59	*Not applicable*
Noise	
GP-60	*Not applicable*
GP-61	*Not applicable*
GP-62	*Not applicable*

TABLE 4. PROPOSED BRRTP MITIGATION MEASURES

Mitigation Measure	Description
BIO-1	*Provide restoration/compensation for impacted sensitive vegetation communities.* 1a. The intent of this mitigation measure is to require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF) Land Management Plan (LMP). Before construction LADWP shall have a qualified biologist, where concurrence on the biologist has been provided by the USFS and BLM, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees will be documented by identifying the species, number, location, and diameter at breast height (DBH). On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. 1) For NFS and BLM lands, the USFS and BLM shall review and approve a Habitat Restoration and Revegetation Plan, prepared by LADWP in coordination with the federal agencies, for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-federal lands, LADWP shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for topsoil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bare-root or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program; (j) locations and impacts to all oaks and native trees (over three inches DBH); (k) locations of temporary or permanent gates, barricades, law enforcement patrolling, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (NFS and BLM lands only). Restoration efforts will not adversely affect listed species or critical habitat, and measures will be implemented to protect these species during restoration. 2) LADWP shall utilize a USFS/BLM approved locally collected seed mix, locally collected cuttings, bare-root stock, etc., to revegetate areas disturbed by construction activities. All habitats dominated by non-native species before Project disturbance shall be revegetated using appropriate native species. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc., will be accepted without the approval of the USFS and BLM on NFS/BLM lands, and seeds must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-Project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring reporting will be yearly from years one to five and every other year from years six to ten or until the success criteria are met. LADWP shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the ANF LMP. If the survival and cover requirements have not been met, LADWP is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned. 3) On NFS land, the USFS/LADWP will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees (over 3 inches DBH) in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location, and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes, shall not occur until the trees are evaluated by a USFS botanist or authorized arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or adding spoil around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be replaced at the rate appropriate to the DBH.

Mitigation Measure	Description
	4) The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks that are to be removed on the ANF shall be as follows: trees from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following California Department of Fish and Game (CDFG) guidelines. On the ANF, any oak or native tree that must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated (off-site) at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by an authorized arborist and USFS botanist. On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.
	5) Permanent impacts on federal lands shall be determined by the appropriate federal manager (USFS and BLM) at the ratios stated below (Table BIO-MM-1) or at a comparable value. On NFS and BLM lands, impacts will be considered permanent if the trees are not likely to recover by ten years post-disturbance. Where on-site restoration is planned for mitigation of temporary impacts to vegetation communities, LADWP shall identify a Habitat Restoration Specialist, where concurrence has been provided by the USFS, to implement the method of restoration outlined by the USFS/BLM in the Habitat Restoration Plan.
	6) On USFS/BLM lands, the creation or restoration of habitat shall be monitored after mitigation site construction to assess progress and identify potential problems with the restoration site. This will be monitored on USFS/BLM lands until the success criteria are met or annually for years one to five, and bi-annually for years six to ten. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken until the success criteria are met, if necessary, to ensure the success of the restoration effort. If the mitigation fails to meet the established performance criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the USFS/BLM (as appropriate). If a fire occurs in a revegetation area before the success criteria are met, LADWP shall be responsible for a one-time replacement. If a second fire occurs, no replanting is required, unless the fire is caused by LADWP activity. Off-site mitigation for NFS/BLM and non-NFS/BLM lands may be required if mitigation rates exceed what can be achieved on NFS/BLM land. This may be in the form of funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts.
	1b. During and after construction, USFS/BLM-identified potential or existing entrances to Project-related disturbed areas such as access/spur roads, pull sites, staging areas, fly yards, landing zones, etc. on NFS/BLM lands shall be gated, blockaded and/or concealed in some manner and maintained to prevent the unauthorized use by the general public. Signs prohibiting unauthorized use of these disturbance areas shall be posted on these barricades if deemed necessary by the USFS/BLM. If barricades are being compromised, law enforcement patrolling may also be implemented to control unauthorized access onto Project disturbance areas.
	1c. Treat cut tree stumps with Sporax. All stumps of trees (conifers and hardwoods) resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the USFS.

TABLE BIO-MM-1. SUMMARY OF ESTIMATED IMPACTS TO VEGETATION COMMUNITIES ON FEDERAL LANDS

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Alternative 1								
Chamise Chaparral	USFS	16.73	3:1	50.19	56.06	1:1	56.06	106.25
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.30
Riversidian Sage Scrub	USFS	3.06	5:1	15.3	10.48	2:1	20.96	36.26
Southern Coast Live Oak Riparian Forest	USFS	0.05	5:1	0.25	0.38	2:1	0.76	1.01
Southern Cottonwood Willow Riparian Forest	USFS	0.42	5:1	2.1	0.86	2:1	1.72	3.82
Southern Mixed Chaparral	USFS	14.13	3:1	42.39	45.81	1:1	45.81	88.20
Southern Sycamore Alder Riparian Woodland	USFS	0.13	5:1	0.65	0.25	2:1	0.5	1.15
Southern Willow Scrub	USFS	0.32	3:1	0.96	1.30	2:1	2.6	3.56
Alternative 2								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	7.8	1:1	7.8	24.8	1:1	24.8	32.6
Mojave Creosote Bush Scrub	BLM	2.69	1:1	2.69	21.82	1:1	21.82	24.51
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.06	1:1	2.06	2.31
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.39	2:1	6.78	10.23
Southern Mixed Chaparral	USFS	3.24	3:1	9.72	8.77	1:1	8.77	18.49
Southern Riparian Scrub	USFS	0.33	3:1	0.99	0.66	1:1	0.66	1.65
Southern Sycamore Alder Riparian Woodland	USFS	0.87	5:1	4.35	2.2	2:1	4.4	8.75
Alternative 2a								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	3.24	1:1	3.24	12.72	1:1	12.72	15.96
Interior Live Oak Chaparral	USFS	2.06	5:1	10.3	5.60	2:1	11.2	21.5
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Scrub Oak Chaparral	USFS	1.46	5:1	7.3	3.19	2:1	6.38	13.68
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.40	2:1	6.8	10.25
Southern Mixed Chaparral	USFS	9.03	3:1	27.09	27.88	1:1	27.88	54.97
Southern Riparian Scrub	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland	USFS	0.81	5:1	4.05	1.64	2:1	3.28	7.33
Alternative 3								
Chamise Chaparral	BLM	0.00	1:1	0.0	0.02	1:1	0.02	0.02
Barren/developed	USFS	1.04	1:1	1.04	2.13	1:1	2.13	3.17
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	9.57	5:1	47.85	28.19	2:1	56.38	104.23
Scrub Oak Chaparral	USFS	2.87	5:1	14.35	5.83	2:1	11.66	26.01
Southern Riparian Scrub	USFS	0.34	5:1	1.7	0.69	2:1	1.38	3.08
New Circuit								
Chamise Chaparral	USFS	8.03	3:1	24.09	23.05	1:1	23.05	47.14
Riversidian Sage Scrub	BLM	0.04	1:1	0.04	0.34	1:1	0.34	0.38
Riversidian Sage Scrub	USFS	1.98	5:1	9.9	5.96	2:1	11.92	21.82
Southern Coast Live Oak Riparian Forest	USFS	0.08	5:1	0.4	0.66	2:1	1.32	1.72
Southern Cottonwood Willow Riparian Forest	USFS	0.40	5:1	2.0	0.80	2:1	1.6	3.6
Southern Sycamore Alder Riparian Woodland	USFS	0.09	5:1	0.45	0.19	2:1	0.38	0.83

Vegetation Communities	**Jurisdiction**	**Permanent Impacts (acres)**			**Temporary Impact (acres)**			**Total Estimated Mitigation (acres)**
		Estimated Impact	**Ratio**	**Estimated Off-site Mitigation**	**Estimated Impact**	**Ratio**	**Estimated On-site Restoration**	
Reconductoring								
Chamise Chaparral (Segment ABG)	USFS	16.07	3:1	48.21	32.65	1:1	32.65	80.86
Barren/developed (Segment ABG)	USFS	7.77	1:1	7.77	25.28	1:1	25.28	33.05
Mojave Creosote Bush Scrub (Segment ABG)	BLM	2.85	1:1	2.85	23.16	1:1	23.16	26.01
Mojave Wash Scrub (Segment ABG)	BLM	0.23	1:1	0.23	1.86	1:1	1.86	2.09
Riversidian Sage Scrub (Segment ABG)	USFS	5.07	5:1	25.35	10.30	2:1	20.6	45.95
Southern Coast Live Oak Riparian Forest (Segment ABG)	USFS	3.25	5:1	16.25	6.60	2:1	13.2	29.45
Southern Mixed Chaparral (Segment ABG)	USFS	2.86	3:1	8.58	8.01	1:1	8.01	16.59
Southern Riparian Scrub (Segment ABG)	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland (Segment ABG)	USFS	0.95	5:1	4.75	2.34	2:1	4.68	9.43
Southern Coast Live Oak Riparian Forest (Segment K)	BLM	0.02	1:1	0.02	0.04	1:1	0.04	0.06
Southern Mixed Chaparral (Segment K)	BLM	0.00	1:1	0.0	0.01	1:1	0.01	0.01

Note: The permanent and temporary impact calculations provided above are estimates based on the impact model described in Appendix C of the Biological Resources Technical Report. Therefore, acreage numbers for the habitat types listed above may be smaller than those listed in the table. Preconstruction surveys will be conducted to estimate the acreage impacts and will be based on the final design not the impact model.

Mitigation Measure	**Description**
BIO-2	*The following prescriptions would prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.* 2a **Prepare and implement a Weed Control Plan.** LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. The long-term Weed Control Plan, including monitoring and eradication, will be defined as part of the 50 year Operations and Maintenance Permit. On the ROW easement lands administered by the USFS/BLM, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations including consulting with CDFG on CESA species. The Weed Control Plan shall be submitted to the USFS/BLM for final authorization of weed control methods, practices, and timing before implementation of the Weed Control Plan on public lands. Weed control on BLM lands using pesticides will require an approved BLM Pesticide Use Permit. Pesticide Use Permits are issued for a maximum of three years. ROW easements on private lands shall include adaptive provisions such as wheel and equipment washing for the implementation of the Weed Control Plan. The Weed Control Plan shall include the following: 1) A pre-construction weed inventory shall be conducted on NFS and BLM lands by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006); (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the USFS and/or BLM as species of priority (for NFS/BLM lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated before construction according to control methods and practices for invasive weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated

Mitigation Measure	Description
	and utilized for eradication and monitoring post-construction. 2) Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all State and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator, if the herbicide is in the restricted use category. The most effective herbicides with the least toxic surfactant available shall be used. Herbicides shall not be applied during or within 24 hours of a 70% chance of occurring rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used. Herbicides shall not be applied by spray equipment when wind velocities exceed 10 mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied at over 15 mph. In areas containing special-status plants or animals, there will be a 5- to 70-foot buffer where herbicides are not used. The size of the buffer will be determined and flagged for avoidance by an authorized botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of species, vulnerability of herbicide being used, concentration of herbicide used based on no observed effect concentrations and/or environmental conditions and terrain. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds. Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by an agency botanist. For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows. 3) On the ANF and BLM lands, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten, or until success criteria are met. Treatment of all identified weed populations shall occur at an appropriate interval so as to meet the success criteria. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that impact site. 4) During Project preconstruction and construction, all seeds and straw materials shall be weed-free rice straw, and all gravel and fill material shall be certified weed-free by the county Agriculture Commissioners' Offices. Any deviation from this must be approved by a USFS/BLM botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the USFS/BLM. 5) Before beginning preconstruction activities, the USFS, in coordination with LADWP, will determine suitable locations to install field washing stations as part of the Weed Control Plan. Before commencing construction activities, LADWP shall document that all vehicles, equipment, and tools used on the Project have been cleaned at existing construction yards or legally operating car washes. This is a one-time requirement designed to address the potential of new species of weeds being transported from outside the area. If, however, vehicles, equipment, or tools are used or driven off paved roads on non-NFS lands, washing must occur before entering USFS lands. During Project preconstruction and construction, all vehicles, equipment, or tools which will be used outside of permitted Project roadways shall be washed at the nearest station before operating off-road. In other areas also designated by the USFS, vehicles, equipment, and tools will be washed at the nearest station after exiting those areas. Vehicles that do not leave permitted Project roadways are not required to be washed after the initial washing described above. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the USFS. Plant material may also be removed by air compressors, if effective equipment is located. Air washing must also occur at USFS botanist/LADWP-approved locations. Written daily logs shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the USFS for inspection at any time and shall be

Mitigation Measure	Description
	submitted to the USFS permit administrator on a monthly basis. 6) During Project operation and maintenance activities, weeds shall be cleared and disposed of in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a USFS/BLM-approved method. **2b** **Remove weed seed sources from construction access routes.** Before construction, LADWP shall initiate invasive species eradication. Populations to be treated will be small to moderate and isolated, but have the potential to spread aggressively during construction. Post-construction, these isolated populations will be included and treated according to the restoration plan. Per the Forest Service Manual (FSM) 2080 Best Management Practice (BMP) guideline, LADWP shall also remove or reduce sources of weed seed along the travel routes associated with Project construction. Weed species identified along the Alternatives and associated access roads include tocalote, artichoke thistle, tree tobacco, saltcedar, slender wild oat/wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, blessed thistle, filaree, shortpod mustard, prickly lettuce, common horehound, yellow sweetclover, rabbit foot grass, Mediterranean grass, sowthistle, rat-tail fescue, tree-of-heaven, giant reed grass, yellow starthistle, bull thistle, fennel, perennial pepperweed, and black locust.. To prevent the introduction or control the spread of noxious weeds, herbicide, hand removal or other control methods will be implemented to reduce seed production during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, LADWP shall identify, using an authorized plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF and BLM lands. Target infestations identified by Project surveys should be controlled before construction. LADWP shall initiate eradication of the target infestations discovered during pre-construction surveys along construction routes. **2c** **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Before construction and during each year of use for construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF and BLM lands, weed-infested areas should be hand-weeded and/or treated as appropriate for the individual weed species under the guidance of an authorized plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the USFS/BLM. Unless otherwise authorized by the USFS/BLM, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, bromes and other noxious weed seed production, by herbicide application or other control techniques prior to flowering. All plant debris shall be disposed of at a USFS/BLM approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by an authorized plant ecologist or restoration ecologist in coordination with LADWP and USFS/BLM botanist or weed specialist. **2d** **Use of Herbicides to Control Exotic Weeds.** LADWP may use herbicides where deemed necessary for the control of exotic weeds within the Project area. Weed control should be species-specific, and herbicides should be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for that weed species. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. Any herbicide use on NFS lands would be subject to the review and approval of the appropriate USFS personnel and in coordination with LADWP.
BIO-3	*Incorporate riparian area avoidance and permit measures.* The following actions and all permit conditions detailed within the Nationwide 12 permit, CDFG 1602 Streambed Alteration Agreement, and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). **3a** Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1 to August 15) unless otherwise approved by the USFS. LADWP shall prepare and implement a USFS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal or tree trimming), monitoring requirements, and restoration requirements. This Plan shall be submitted to the USFS

Mitigation Measure	Description
	for approval before construction or the grading of any access road. **3b** Before construction, the authorized biologist shall stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones will include a 10-foot buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities shall be restricted from these zones, although essential vehicle operation and foot travel will be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited within the exclusion zone. **3c** In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector and USFS, shall narrow the width of the road through the area to the minimum extent required for safe travel. New spur roads and existing access road improvements shall be constructed and implemented using methodology that preserves existing hydrology. **3d** Towers shall not be constructed in riparian areas. **3e** All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities shall be restored according to the guidelines of the Habitat Restoration Plan to the extent required to ensure no net loss of habitat functions and values. Following construction activities, the areas will be restored as soon as practicable. **3f** Permanent, unavoidable losses of riparian areas will be mitigated by restoration and/or preservation of off-site habitats, as outlined in the Habitat Restoration Plan. The final mitigation and off-site restoration locations will be determined in consultation with LADWP and the responsible agency(s). Mitigation acreage ratios will be consistent with those listed in Table BIO-MM-1.
BIO-4	*Provide restoration/compensation for affected jurisdictional areas.* **4a** Impacts to areas under jurisdiction of the USACE, RWQCB, USFS and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible, including emergency repairs, and access/spur roads within RCAs, the applicant shall provide the necessary mitigation required as part of wetland permitting. This will include creation, restoration, and/or preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation will be determined in consultation with LADWP and the responsible agency(s) as part of the wetland permitting process. **4b** Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas.
BIO-5	**5a.** *Wildlife Measure*
BIO-6	*Implement a Worker Environmental Awareness Program.* An authorized biologist(s) shall conduct a detailed biological Worker Environmental Awareness Program (WEAP) for all Project personnel before any construction or activities within the Project footprint. The WEAP shall include discussions of Project permits and brief summaries of their conditions; discussions of agency involvement, their applicable sensitivity measures, and relevant environmental protection legislation (e.g., the Endangered Species Act, the Migratory Bird Treaty Act); descriptions of special-status species and other sensitive resources that could exist in the Project area, along with their locations, legal status and protections; and a review of all measures to be implemented for avoidance of these sensitive resources. The final list of wildlife species to be included in the WEAP may be reduced at the discretion of the authorized biologist with concurrence from applicable agencies. **6a.** Training materials and briefings shall also include the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS and BLM lands and identification of USFS and BLM sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. Discussion of GPs and BMPs shall include topics such as appropriate work limits, avoiding the spread of non-native plant species, fire safety, wildlife avoidance, trash and debris collection, spill prevention and containment protocol, and appropriate protocol for passage and/or construction near riparian zones. Sightings of sensitive wildlife species or harmful encounters with any wildlife species shall be reported to the authorized biologist immediately for evaluation and, as necessary, reporting to agencies. **6b.** Training materials and a course outline shall be provided to the USFS/BLM for review and approval at least 30 days before the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (e.g., limited operating periods) will be provided to the environmental monitors and construction crews before ground disturbance.

Mitigation Measure	Description
	6c. The training shall be conducted for all crew members present for the start of construction. If new crew members are brought to the Project after this time, they shall take part in the WEAP before beginning construction work; if the biologist is not available at this time, new crew members shall be given a summary handout of the WEAP until the full WEAP can be administered by the authorized biologist, to be conducted no more than one workweek following the crew members' assignment to the Project. All crew members who have completed the WEAP shall submit their names to a list to be updated continuously and furnished to agencies upon request. No construction worker may work in the field for more than five days without participating in the WEAP.
BIO-7	*Wildlife Measure*
BIO-8	*Wildlife Measure*
BIO-9	*No mitigation measures required for Impact BIO-9.*
BIO-10	*No mitigation measures required for Impact BIO-10.*
BIO-11	*Wildlife Measure*
BIO-12	*No mitigation measures required for Impact BIO-12.*
BIO-13	*Protect special-status plant species and their habitat.* **13a.** Conduct preconstruction surveys for State and federal Threatened, Endangered, Proposed, Petitioned, Candidate, USFS Sensitive, USFS Watch, BLM Sensitive, and California Native Plant Society (CNPS) listed plants and avoid any occurrences of these plants. LADWP shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in a 250-foot radius around all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by an authorized plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS. The résumés of the proposed biologists will be provided to the USFS and BLM for concurrence before ground disturbance. The completion of these surveys shall be coordinated with the federal land manager. All listed plant species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with USFWS will occur. **13b.** Before site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance, including human trampling, erosion, and dust. The size of the buffer will depend upon the proposed use of the immediately adjacent lands, and include consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS, CDFG, USFS, and BLM and in coordination with LADWP. If impacts to listed plants are determined to be unavoidable, the USFWS shall be consulted for authorization, through the context of a Biological Opinion. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS before impacts are authorized, whichever is appropriate. **13c.** Impacts to non-listed plant species (i.e., USFS Sensitive, CNPS List 1, 2, and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other USFS or BLM approved methods. For USFS lands, if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of USFS Sensitive plant species, and reseeding/transplanting are not feasible options, LADWP shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).This ratio will apply only to specific acreage inhabited by special-status plant species that are removed during construction, and will supersede ratios listed in Table BIO-MM-1 regardless of habitat type. The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall

Mitigation Measure	Description
	species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist. **13d.** All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the federal land manager (USFS and BLM) until the success criteria outlined in the Habitat Restoration Plan are met. Where reseeding has occurred, LADWP shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the federal land manager (USFS and BLM).
BIO-14	*Wildlife Measure*
BIO-15	*Wildlife Measure*
BIO-16	*Wildlife Measure*
BIO-17	*Wildlife Measure*
BIO-18	*Wildlife Measure*
BIO-19	*Wildlife Measure*
BIO-20	*Wildlife Measure*
BIO-21	*Wildlife Measure*
BIO-22	*Wildlife Measure*
BIO-23	*Wildlife Measure*
BIO-24	*Wildlife Measure*

1.3 EXISTING ENVIRONMENT

The physiography of the Project area in the Los Angeles and Kern County regions from north to south is the flat Antelope Valley gradually rising in elevation (Northern region) and giving way to the foothills of the Angeles National Forest (Central region). Continuing south, the foothills gradually give way to the City of Santa Clarita (Southern region). Drainages originating from the foothills of the ANF have carried rock detritus and water to the Santa Clarita area. This has produced several riparian areas, which support a rich, varied, and unique ecosystem. The diversity and distribution of biological resources within the study corridor are a function of the regional climate, soils, and topography. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species. To provide baseline conditions for the dominant soil type, water and habitat characteristics the biological study was divided to three ecotype regions (Northern, Central and Southern). The Northern and Southern regions of the Project do not occur within the ANF at all and are not discussed further. The Central region of the BRRTP encompasses the southern ends of Alternatives 1, 2, 2A, and 3, as well as Segment J (new 230 kV circuit between Haskell Canyon and the Castaic Power Plant), and is discussed below in greater detail.

1.4 CENTRAL REGION – ANF BOUNDARIES

Alternatives 1, 2, 2A, 3, the new 230 kV circuit (Segment J), and reconductoring component within the ANF are located in steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands (Table 5). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

TABLE 5. SOIL TYPES PRESENT IN CENTRAL REGION

Segment	Soil Series	Drainage Class	Series Soil pH
Alternative 1	Cortina	Excessively drained	Slightly acid
Alternative 1	Hanford	Well drained	Slightly alkaline
Alternative 1	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 1	Millsholm	Well drained	Neutral to slightly acid
Alternative 1	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 1	Osito family	Well drained	Neutral to slightly acid
Alternative 1	Rock outcrop	N/A	Neutral
Alternative 1	Saugus	Well drained	Slightly acid
Alternative 1	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Amargosa	Excessively drained	Neutral
Alternative 2/ Reconductor	Chino	Excessively drained	Moderately alkaline
Alternative 2/ Reconductor	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Greenfield	Well drained	Neutral
Alternative 2/ Reconductor	Hanford	Well drained	Slightly acid
Alternative 2/ Reconductor	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Millsholm	Well drained	Slightly acid
Alternative 2/ Reconductor	Mollic Haploxeralfs	Well drained	Extremely acid
Alternative 2/ Reconductor	Ramona	Well drained	Moderately acid
Alternative 2/ Reconductor	Rock outcrop	N/A	Neutral
Alternative 2/ Reconductor	San Andreas family	Well drained	Moderately acid
Alternative 2/ Reconductor	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 2/ Reconductor	Tujunga family	Excessively drained	Slightly acid
Alternative 2/ Reconductor	Vista	Well drained	Neutral
Alternative 2/ Reconductor	Yolo	Well drained	Neutral
Alternative 2A	Amargosa	Excessively drained	Neutral
Alternative 2A	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 2A	San Andreas family	Well drained	Moderately acid
Alternative 2A	Trigo family	Somewhat excessively drained	Slightly acid
Alternative 3	Amargosa	Excessively drained	Neutral
Alternative 3	Anaverde	Well drained	Neutral
Alternative 3	Castaic	Well drained	Slightly acid
Alternative 3	Cortina	Excessively drained	Slightly acid
Alternative 3	Exchequer family	Somewhat excessively drained	Slightly acid
Alternative 3	Godde	Well drained	Slightly acid
Alternative 3	Greenfield	Well drained	Neutral
Alternative 3	Hanford	Well drained	Slightly acid
Alternative 3	Lodo family	Somewhat excessively drained	Slightly acid
Alternative 3	Metz	Somewhat excessively drained	Moderately alkaline
Alternative 3	Mocho	Well drained	Moderately alkaline
Alternative 3	Saugus	Well drained	Neutral to slightly acid
Alternative 3	Vista	Well drained	Neutral
Alternative 3	Wyman	Well drained	Neutral
Alternative 3	Yolo	Well drained	Neutral
New 230 kV Circuit	Castaic	Well drained	Slightly acid
New 230 kV Circuit	Hanford	Well drained	Slightly acid
New 230 kV Circuit	Metz	Somewhat excessively drained	Moderately alkaline

Segment	Soil Series	Drainage Class	Series Soil pH
New 230 kV Circuit	Millsholm	Well drained	Slightly acid
New 230 kV Circuit	Mollic Haploxeralfs	Well drained	Extremely acid
New 230 kV Circuit	Rock outcrop	N/A	Neutral
New 230 kV Circuit	Saugus	Well drained	Neutral to slightly acid
New 230 kV Circuit	Zamora	Well drained	Neutral

Within the central eco-region boundary, the vegetation composition is predominantly shrubs, approximately 137,000 acres. The eco-region is dominated by mixed chaparral series with a sparse mixture of deciduous and pine forests, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin. Predominant plant species include *Quercus* spp. (Oak species), *Ceanothus* spp. (Sugar Brush), *Arctostaphylos glauca* (Big Berry Manzanita), *Adenostoma fasciculatum* (Chamise) and *Eriogonum fasciculatum* (California buckwheat). There are three major drainages and several small drainages that originate from the foothills of the Angeles National Forest and spread over the northwestern Los Angeles County region. The San Francisquito Canyon Creek, a minor drainage in the area, has several small distributaries. A second drainage, originating from Bouquet Reservoir, is Bouquet Canyon Creek. The third drainage, Santa Clara River, has several small distributaries, including Mint Canyon Creek, Rowher Canyon Creek, and Aqua Dulce Canyon Creek. The Santa Clara River also has two minor distributaries, San Francisquito Canyon Creek and Bouquet Canyon Creek. Many reaches of these natural and modified stream channels have the ability to support riparian areas and function as wildlife corridors.

Wildfires are an integral part in the biodiversity of plant and animals ecosystems in Southern California (Zedler 1995). Within the last fifty years, there have been nine fires that have burned over 10,000 acres within the Project area. One of the more recent large wildfires was the 2007 Buckweed Fire, which burned approximately 40,000 acres east of Santa Clarita and north of State Route 14 and burned through a significant portion of Alternatives 2 and 2a. The vegetation in this burned portion of Alternative 2 is varying in its regrowth response from a range of poor to moderate. The lack of highly successful regrowth can be attributed to the prevalence of invasive, non-native plants, which are outcompeting the native species.

1.4.1 Vegetation Communities

The Project Area within the ANF was surveyed during the spring and summer months in 2008, 2009, and 2010. Botanical surveys were conducted and current vegetation communities were mapped and the data used to refine existing Project vegetation maps that were based off of Gap Analysis Program (GAP) data. Twelve major vegetation communities were identified within the Project area in the Angeles National Forest. The most abundant is chamise chaparral, which appears most prominently on Alternative 2 and the new 230 kV Conductoring line, and is present on a majority of the Project area. Southern mixed chaparral, barren/developed land, and Riversidian sage scrub are all present in lower amounts relative to chamise chaparral. Scrub oak chaparral is present in the lowest amount of all vegetation communities, comprising less than 1% of the total Project area. Vegetation communities that are present within the forested Project Area and their respective acreages and disturbance estimates include the following:

TABLE 6. ESTIMATED TEMPORARY DISTURBANCE OF VEGETATION COMMUNITIES WITHIN THE BRRTP

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Alternative 1 - 230 kV Double-circuit Transmission Line							
Chamise Chaparral	Forest Service	488.38	50.87	56.06	9.98	16.73	3.43%
Riversidian Sage Scrub	Forest Service	100.74	9.74	10.48	1.84	3.06	3.04%
Southern Coast Live Oak Riparian Forest	Forest Service	3.59	0.38	0.38	0.05	0.05	1.35%
Southern Cottonwood Willow Riparian Forest	Forest Service	8.04	0.86	0.86	0.23	0.42	5.28%
Southern Mixed Chaparral	Forest Service	349.92	40.80	45.81	8.36	14.13	4.04%
Southern Sycamore Alder Riparian Woodland	Forest Service	2.38	0.25	0.25	0.07	0.13	5.28%
Southern Willow Scrub	Forest Service	12.91	1.11	1.30	0.19	0.32	2.48%
Alternative 2 – 230 kV Double-circuit Transmission Line							
Chamise Chaparral	Forest Service	344.45	38.61	39.38	6.9	10.11	2.9%
Barren/developed	Forest Service	231.75	24.86	24.86	4.84	7.80	3.4%
Riversidian Sage Scrub	Forest Service	82.47	8.85	8.85	1.37	1.84	2.2%
Southern Coast Live Oak Riparian Forest	Forest Service	20.33	3.01	3.40	0.56	0.69	3.4%
Southern Mixed Chaparral	Forest Service	81.79	8.77	8.77	1.89	3.24	4.0%
Southern Riparian Scrub	Forest Service	6.19	0.66	0.66	0.17	0.33	5.3%
Southern Sycamore Alder Riparian Woodland	Forest Service	20.32	2.18	2.18	0.50	0.50	2.5%
Alternative 2A - 230 kV Double-circuit Transmission Line							
Canyon Live Oak Forest*		-	-	-	-	-	-
Chamise Chaparral	Forest Service	344.44	38.61	39.38	6.90	10.11	2.94%
Barren/developed	Forest Service	119.26	12.45	12.72	2.15	3.24	2.72%
Interior Live Oak Chaparral	Forest Service	53.92	5.18	5.60	1.14	2.06	3.83%
Riversidian Sage Scrub	Forest Service	82.47	8.85	8.85	1.37	1.84	2.23%
Scrub Oak Chaparral	Forest Service	30.05	3.12	3.19	0.78	1.46	4.85%
Southern Coast Live Oak Riparian Forest	Forest Service	20.33	3.01	3.40	0.56	0.69	3.39%
Southern Mixed Chaparral	Forest Service	268.16	25.39	27.88	5.17	9.03	3.37%
Southern Riparian Scrub	Forest Service	6.19	0.66	0.66	0.17	0.33	5.28%
Southern Sycamore Alder Riparian Woodland	Forest Service	15.32	1.64	1.64	0.43	0.81	5.27%
Alternative 3 - 230 kV Double-circuit Transmission Line							
Barren/developed	Forest Service	19.45	2.12	2.13	0.56	1.04	5.35%
Riversidian Sage Scrub	Forest Service	140.94	24.72	28.19	5.81	9.57	6.79%
Scrub Oak Chaparral	Forest Service	54.36	5.83	5.83	1.52	2.87	5.28%
Southern Riparian Scrub	Forest Service	6.47	0.69	0.69	0.18	0.34	5.28%
Reconductoring							
Chamise Chaparral	Forest Service	304.26	32.65	32.65	8.54	16.07	5.3%
Barren/developed	Forest Service	235.69	25.28	25.28	4.86	7.77	3.3%
Riversidian Sage Scrub	Forest Service	85.68	10.30	10.30	2.69	5.07	5.9%
Southern Coast Live Oak Riparian Forest	Forest Service	61.53	6.60	6.60	1.73	3.25	5.3%
Southern Mixed Chaparral	Forest Service	74.74	8.01	8.01	1.69	2.87	3.8%
Southern Riparian Scrub	Forest Service	6.17	0.66	0.66	0.17	0.33	5.3%

Vegetation Community	Jurisdiction	Total Acreage	Temporary Minimum Disturbance (Ac)	Temporary Maximum Disturbance (Ac)	Permanent Minimum Disturbance (Ac)	Permanent Maximum Disturbance (Ac)	Percentage of Total Habitat Permanently impacted in each jurisdiction
Southern Sycamore Alder Riparian Woodland	Forest Service	19.61	2.34	2.34	0.54	0.95	4.8%
New 230 kV Circuit							
Chamise Chaparral	Forest Service	139.37	21.06	23.05	4.73	8.03	5.8%
Riversidian Sage Scrub	Forest Service	55.49	5.96	5.96	1.20	1.98	3.6%
Southern Coast Live Oak Riparian Forest	Forest Service	6.11	0.66	0.66	0.08	0.08	1.3%
Southern Cottonwood Willow Riparian Forest	Forest Service	7.49	0.80	0.80	0.21	0.40	5.3%
Southern Sycamore Alder Riparian Woodland	Forest Service	1.78	0.19	0.19	0.05	0.09	5.1%

*Note: Although Canyon Live Oak Forest was identified as a vegetation community present on Alternative 2a during 2010 BRRTP botanical surveys, it is not one of the communities listed in the Gap Analysis Program (GAP) data for this area (POWER 2010c). Because vegetation community mapping was not conducted during the botanical surveys, the exact area and corresponding impact acreages for Canyon Live Oak Forest were not calculated. Acreage numbers for other habitat types listed on Alternative 2a thus may be smaller than those listed in the table above, which is based only on GAP data. This will not change the total acreage of Alternative 2a.

2.0 INVENTORY RESULTS AND RISK ASSESSMENT

An inventory for noxious and other invasive weed species was performed concurrently with focused rare plant surveys and floristic inventories on the ANF for the Project alternative areas. These surveys are described in the BA/BE. Risk is assessed for areas of potential disturbance, and is discussed in Section 3.0. Noxious weeds listed and described below include those which could occur in or near the Project area. While not all of these species were located during botanical surveys, it is understood that they may still occur in the Project area at the time of construction. Therefore, all potential noxious weed species are analyzed in this section with their level of risk, life history, and known control methods if encountered within the Project area.

2.1 DEFINITION OF NOXIOUS WEEDS

Noxious weeds are defined in this weed risk assessment as any plant species designated as such by the Secretary of Agriculture, pursuant to the Plant Protection Act of 2000, or by a responsible State official, as the case may be. Noxious weeds typically conform to at least one of the following traits: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and non-native, new, or uncommon in the United States or its specific parts (USFS 1990). Numerous noxious weed species are known to exist near or within the Project area, according to surveys conducted for Forest Service land management plans (USFS 2005) and surveys conducted for the BRRTP in 2008, 2009, and 2010.

Noxious weed species are organized below in Table 7 according to California Invasive Plant Inventory (Cal-IPC 2006) and California Department of Food and Agriculture (CDFA 2009) threat ratings. Included are species that were observed during surveys. This Forest Service list of non-native plants is not exhaustive, but represents known and/or approved target noxious weed species occurring within or near the Project site locations or rights-of-way. These are the species that were considered in the weed risk assessment analysis. Selected species were mapped during surveys, according to instructions from the Forest Service botanist.

TABLE 7. NOXIOUS AND INVASIVE WEED SPECIES IN OR NEAR ALL ALTERNATIVES OF THE PROJECT AREA ON THE ANF

SPECIES NAME	COMMON NAME
High Risk Noxious Weed Species	
Arundo donax	giant reed
Bromus madritensis ssp. *rubens*	red brome
Bromus tectorum	cheatgrass
Centaurea solstitialis	yellow star-thistle
Foeniculum vulgare	fennel
Lepidium latifolium	perennial pepperweed
Rubus discolor	Himalayan blackberry
Spartium junceum	Spanish broom
Tamarix ramosissima	tamarisk
Moderate Risk Weed Species	
Ageratina adenophora	eupatory
Ailanthus altissima	tree of heaven
Avena bartata	slender wild oat
Avena fatua	wild oat
Bromus diandrus	ripgut brome
Centaurea melitensis	tocalote
Cirsium vulgare	bull thistle
Cynara cardunculus	artichoke thistle
Hirschfeldia incana	shortpod mustard
Nicotiana glauca	tree tobacco
Sisymbrium altissimum	tumble mustard
Vulpia myuros	rat-tail fescue
Lower Risk Weed Species	
Bromus hordeaceus	soft chess brome
Cistus ladanifer	crimson spot rockrose
Cnicus benedictus	blessed thistle
Erodium spp.	filaree
Lactuca serriola	prickly lettuce
Lathyrus latifolius	perennial sweet pea
Marrubium vulgare	horehound
Melilotus officinalis	yellow sweetclover
Piptatherum miliaceum	smilo grass
Polypogon monspeliensis	rabbitfoot grass
Robinia pseudoacacia	black locust
Salsola tragus	Russian thistle
Schismus barbatus	Mediterranean grass
Sonchus spp.	sowthistle

2.2 SPECIES ACCOUNTS OF WEEDS AND KNOWN APPROPRIATE CONTROL METHODS

2.2.1 High Risk Noxious Weed Species

These species have high impacts on physical processes, plant and animal communities, and vegetation structure of the environments in which they establish. They typically experience moderate to high rates of dispersal and establishment and most have wide ecological distribution ranges.

Giant Reed (*Arundo donax*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: B
Observed within Survey Area: Yes, observed in the new 230 kV circuit corridor and access road for Segment D (Alternative 1).

Ecology

Giant reed is a tall perennial in the Grass Family (*Poaceae*) that grows to eight feet (DiTomaso and Healy 2007). Giant reed grass forms dense stands on disturbed sites, sand dunes, riparian areas, and wetlands (Cal-IPC 2008). Giant reed occurs in many soil types, grows best in well drained moist soils, and can tolerate some salinity to an elevation of 1,630 feet (DiTomaso and Healy 2007). This species reproduces vegetatively from rhizomes and fragments of stems and rhizomes (DiTomaso and Healy 2007). It has invaded central California River valleys in San Luis Obispo and Monterey Counties, the San Francisco Bay Area, and the Sacramento and San Joaquin River valleys, and is also increasing in the North Coast region. Giant reed is threatening California's riparian ecosystems by outcompeting native species, such as willows, for water, nutrients, and space.

Control Methods

- Prevention: The best preventative measure is the early removal of small infestations. As no known reproduction takes place by seed, all rhizome fragments must be removed from the site to ensure eradication.
- Mechanical: Smaller plants (less than six feet tall) can be pulled by hand when the soil is moist. Care should be taken to remove all rhizome (underground horizontal stems that produce roots below and shoots above) fragments. With larger plants, the aboveground canes can be cut with a chainsaw or brushcutter. The rhizomes must then be removed as completely as possible by using shovels, pickaxes, or, in very large infestations, excavators. If it is not possible or feasible to remove all underground rhizomes, stems can be cut in May and then covered with a heavy (so that the re-sprouts do not tear through) tarp for the remainder of the season to shade out re-sprouts; or as described below, a herbicidal treatment may be used to help kill rhizomes. Any removed stems and roots should be burned on-site to prevent rerooting.
- Fire Management: Prescribed burns remove the aboveground canes, but may encourage regrowth. Large infestations of giant reed can produce tall, hot-burning fire ladders that increase the intensity and impact of fires, and also allow flames to spread to the canopy in riparian areas.
- Cultural: A schedule of natural flood dynamics, if available, may help native species to compete with giant reed, which can thrive with or without flooding (McWilliams 2004).
- Herbicide: Herbicide treatment works best to kill any remaining rhizomes after cutting, although some practitioners have used a systemic foliar spray application, sprayed onto intact plants after the plant has flowered, but before summer dormancy (Holloran et al. 2004). Application of systemic herbicide is most effective after the flowering period between July and October, and treatment of regrowth is most effective from March to July (DiTomaso and Healy 2007). Cutting and treating stems of mature plants is an effective method between March and October. Stronger solutions of herbicides can be directly applied to cuts. For a foliar spray, a weaker solution is applied. In either case, only herbicides specifically approved for use in wetland environments should be used.

Red Brome (*Bromus madritensis* ssp. *rubens*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: Unrated

Observed within Survey Area: Yes, observed on all Alternatives.

Ecology

Red brome is native to southern Europe, northern Africa, and southwestern Asia (Cal-IPC 2008), and grows in open disturbed areas, roadsides, fields, ranges, agronomic crops, orchards, forestry sites, and many natural plant communities in California and beyond, up to 7,220 feet in elevation. Red brome is spreading in coastal scrub communities, and since the species is highly flammable when dry, it is also increasing the frequency and spread of wildfire in certain communities, contributing to the conversion of coastal scrub into annual grassland. The species often inhabits areas with dry sandy soils where there is less competition with other vegetation (DiTomaso and Healy 2007).

Red brome provides very little in terms of usable forage or cover for native wildlife species. The seeds are not palatable to herbivores.

Control

- Prevention: Proper stocking levels and the protection of soil resources are the best known land management practices preventing the establishment and spread of cool-season annual grasses in California. However, preventing the spread or eradicating these grasses is difficult. The majority of grasslands within the state are now dominated by these and other exotic annual grasses.
- Mechanical: Few mechanical methods are suitable or effective in annual *Bromus* control. Precisely timed mowing, after the grass has begun to flower, but before it has produced mature seeds (a period of about a week), can help reduce the amount of seed produced each year. In agricultural areas, intensive or deep tilling can help eradicate infestations.
- Fire Management: Burning tends to promote the establishment, growth, and spread of these grass species. Late season burns can significantly increase *Bromus* densities in subsequent years (DiTomaso and Healy 2007). Some practitioners have advocated burning sites after seed is set but before the plants shatter, which reduces the amount of viable seed. However, like other burn control methods, this appears to increase the site's susceptibility to subsequent invasions (DiTomaso and Healy 2007), and therefore is not recommended.
- Cultural: Non-native perennial grasses, such as crested wheatgrass, are effective in out-competing and controlling red brome. However, it has been observed that over time these grasses do not provide an adequate community for local wildlife, and can lead to declines in the populations of small mammals, raptors, sage-grouse, songbirds, and other vertebrates and invertebrates (Zouher 2003). Some native species, however, such as Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), Thurber's needlegrass (*Achnatherum thurberianum*), western wheatgrass (*Pascopyrum smithii*), and thickspike wheatgrass (*Elymus lanceolatus*) have shown success in revegetating and dominating sites once infested by red brome. Any species that is planted for replacement of red brome must be able to germinate and produce a vigorous seedling within one to two days of watering, and then sustain the possibility of a drought. It is recommended that any shrubs that are planted to replace red brome be at least one year old to increase their competitive abilities (Simonin 2001).
- Biocontrol: There are currently no insects or fungi approved by the USDA for use as biological controls against red brome, although there are known fungi and diseases which inhibit the growth or spread of cheatgrass or red brome (Zouhar 2003; Simonin 2001). It is recommended that grazing occur before brome grass plants turn purple, and that two defoliations occur each spring for at least two consecutive years for proper control.
- Herbicide: No herbicidal methods are currently a good option for annual *Bromus* grass control, due to the extensive nature of many infestations. As the grasses become dominant species in the habitats they invade, targeting specific areas for eradication and not affecting other co-occurring native species is difficult. Herbicidal treatment, if conducted, should occur for between two and five

consecutive years (Zouher 2003). Some herbicides that have been effective against red brome, either alone or in combination, are quizalofop, fluazifop-p-butyl, sethoxydim, paraquat, glyphosate, imazapic, sulfometuron methyl, and atrazine. However, care should be taken such that herbicidal treatment does not kill other plants and lead to less competition and greater proliferation of red brome.

Cheatgrass (*Bromus tectorum*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on all Alternatives.

Ecology

Cheatgrass has spread across millions of acres in the west, up to 7,170 feet in elevation, and is thought to have altered the natural fire frequency in many plant communities. It also has the ability to carry fire into areas that previously would not ordinarily burn. The spread of the Devil Fire and Willow Fire, which burned approximately 12,000 acres and 65,000 acres, respectively, are believed to have been facilitated by cheatgrass (DiTomaso and Healy 2007).

The continued spread and dominance of cheatgrass represents several potential impacts to native species. Cheatgrass can out-compete native plant species, including both common and rare species. Cheatgrass can also change the character of the forest floor, covering it with a relatively dense growth of grass where none would have otherwise been present. This can also alter the soil components and productivity. Cheatgrass dries in early summer, leaving the forest floor covered with a dry flashy fuel that carries fire quickly.

Cheatgrass provides very little in terms of usable forage or cover for native wildlife species. The seeds are not palatable to herbivores.

Control

- Prevention: Proper stocking levels and the protection of soil resources are the best known land management practices preventing the establishment and spread of cool-season annual grasses in California. However, preventing the spread or eradicating these grasses is difficult. The majority of grasslands within the state are now dominated by these and other exotic annual grasses.
- Mechanical: Few mechanical methods are suitable or effective in annual *Bromus* control. Precisely timed mowing, after the grass has begun to flower, but before it has produced mature seeds (a period of about a week), can help reduce the amount of seed produced each year. In agricultural areas, intensive or deep tilling can help eradicate infestations.
- Fire Management: Burning tends to promote the establishment, growth, and spread of these grass species. Late season burns can significantly increase *Bromus* densities in subsequent years (DiTomaso and Healy 2007). Some practitioners have advocated burning sites after seed is set but before the plants shatter, which reduces the amount of viable seed. However, like other burn control methods, this appears to increase the site's susceptibility to subsequent invasions (DiTomaso and Healy 2007), and therefore is not recommended.
- Cultural: Non-native perennial grasses, such as crested wheatgrass, are effective in out-competing and controlling cheatgrass. However, it has been observed that over time these grasses do not provide an adequate community for local wildlife, and can lead to declines in the populations of small mammals, raptors, sage-grouse, songbirds, and other vertebrates and invertebrates (Zouher 2003). Some native species, however, such as Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), Thurber's needlegrass (*Achnatherum thurberianum*), western

wheatgrass (*Pascopyrum smithii*), and thickspike wheatgrass (*Elymus lanceolatus*) have shown success in revegetating and dominating sites once infested by cheatgrass. Any species that is planted for replacement of cheatgrass must be able to germinate and produce a vigorous seedling within one to two days of watering, and then sustain the possibility of a drought. It is recommended that any shrubs that are planted to replace cheatgrass be at least one year old to increase their competitive abilities (Simonin 2001).

- Biocontrol: There are currently no insects or fungi approved by USDA for use as biological controls against cheatgrass, although there are known fungi and diseases which inhibit the growth or spread of cheatgrass or red brome (Zouhar 2003; Simonin 2001). It is recommended that grazing occur before cheatgrass plants turn purple, and that two defoliations occur each spring for at least two consecutive years for proper control.
- Herbicide: No herbicidal methods are currently a good option for annual *Bromus* grass control, due to the extensive nature of many infestations. As the grasses become dominant species in the habitats they invade, targeting specific areas for eradication and not affecting other co-occurring native species is difficult. Herbicidal treatment, if conducted, should occur for between two and five consecutive years (Zouher 2003). Some herbicides that have been effective against cheatgrass, either alone or in combination, are quizalofop, fluazifop-p-butyl, sethoxydim, paraquat, glyphosate, imazapic, sulfometuron methyl, and atrazine. However, care should be taken such that herbicidal treatment does not kill other plants and lead to less competition and greater proliferation of the cheatgrass.

Yellow Star-thistle (*Centaurea solstitialis*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: C
Present within Survey Area: Yes, observed in the new 230 kV circuit corridor.

Ecology

Yellow star-thistle is a deep-rooted winter annual forb in the Sunflower Family (*Asteraceae*). Yellow star-thistle inhabits open hills, grasslands, open woodlands, fields, roadsides, and rangelands. This species is considered one of the most serious rangeland weeds in the state (Cal-IPC 2008). Yellow star-thistle is extremely invasive, and at present is spreading in mountainous regions below 7,500 feet in elevation (DiTomaso and Gerlach 2000). It reproduces from seed, and each plant is capable of producing up to 75,000 seeds. Seeds can remain viable in the soil for up to ten years (Callahan et al. 1993). One reason for yellow star-thistle's extreme invasiveness is its ability to grow vigorously late in the season, when most native plants are dormant. It is highly competitive with native plants, especially in grazed areas, and is capable of forming monocultures that maintain dominance over an area for many years.

Control

- Prevention: Fertilizer application, dry-season irrigation, or ill-timed mowing may increase infestation occurrence and severity. Much like tocalote (*Centaurea melitensis*), intense infestations may be avoided through responsible range management, including the appropriate stocking of susceptible rangelands. Vegetation should shade as much of the soil surface as possible to discourage yellow star-thistle growth (Zouhar 2002).
- Mechanical: Mowing can provide effective treatment of infested areas if mowed at the correct time, which is immediately after the earliest 2% to 5% of plants have begun to produce flower heads, usually in June (DiTomaso and Healy 2007). Mowing too early may cause plants to become bushier and produce more flower heads. Treatments should continue for at least two to three years, after which spot eradication may be required indefinitely. Mow immediately after the earliest 2% to 5% of plants have begun to produce flower heads (May/June). Additionally, hand-pulling may be used

as a follow-up treatment for re-sprouting yellow star-thistle rosettes produced by root fragments remaining in the soil.

- Fire Management: Prescribed burning of yellow star-thistle can reduce populations if timed correctly, similar to mowing-based treatments. Burning should occur after other annual plants have dried but before yellow star-thistle seeds are produced (DiTomaso and Healy 2007).
- Cultural: Sites should be revegetated with competitive native or high-forage non-native perennial grasses that are suitable for the site (Zouhar 2002). This may be most effective when combined with herbicide treatments to suppress yellow star-thistle growth. Grazing should not occur until the site has been fully recovered.
- Biocontrol: Responsible rangeland management, where lands are grazed by sheep, goats, or cattle to a moderate degree, can help prevent establishment and/or spread of populations in grasslands. Infested areas can be treated by high-intensity grazing between the period when the plant bolts (May through June) to just before the plant produces spiny seed heads in July and August. Yellow star-thistle is toxic to horses and causes permanent brain damage leading to nigropallidal encephalomalacia, commonly known as chewing disease (DiTomaso and Healy 2007). Several biocontrol insects have been used in attempts to control infestations. Perhaps the most promising insect biocontrol agent is the yellow star-thistle hairy weevil (*Eustenopus villosus*), which causes damage to the seed heads (reducing reproduction) in both the larval and adult stages (Environmental Laboratories 2007). While this and several other biocontrol insects have been established in sites around California, it has yet to substantially reduce infestation throughout the state. In very dense infestations, however, local release may allow the temporary formation of a large, active, biocontrol population in that area. Some of the same insects established for biocontrol of yellow star-thistle may affect spotted knapweed, but these species favor and will preferentially attack yellow star-thistle. Other insect species have been released in California to control knapweeds, but it is too early to gauge the treatment efficacy (DiTomaso and Healy 2007). The following insects have been released for biological control of yellow star-thistle in California (Zouhar 2002):

Control Agent	Mode of Action
Seedhead weevil (*Bangasternus orientalis*)	Attacks the early bud stages
Hairy weevil (*Eustenopus villosus*)	Feeds on mid-stage buds and lays eggs in late-stage buds
Flower weevil (*Larinus curtus*)	Lays eggs in open flowers
Seedhead fly (*Urophora sirunaseva*)	Forms galls in seedheads
Peacock fly (*Chaetorellia australis*)	Feeds in seedheads
False peacock fly (*Chaetorellia succinea*)	Feeds in seedheads

- Herbicide: Herbicide treatments by foliar spray or wick application are generally used to control or reduce spot infestations, or as follow-up to more intensive mechanical, grazing, or fire management-based treatments.

Fennel *(Foeniculum vulgare)*

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed in the new 230 kV circuit corridor.

Ecology

Fennel is an erect perennial herb in the Carrot Family (*Apiaceae*) that flowers from May to October. It reproduces by prolific seed production, and sometimes vegetatively. It tolerates drought and frost

(DiTomaso and Healy 2007). The plant is very common throughout the state, and can drastically alter the composition and structure of many plant communities, including grasslands, coastal scrub, riparian, and wetland communities (Cal-IPC 2008). Fennel can occur in disturbed areas, such as along roadsides, up to 5,860 feet in elevation, but is more common below 1,140 feet. Established plants are competitive, and soil disturbance facilitates the development of dense stands, where native vegetation is sometimes completely excluded (DiTomaso and Healy 2007).

Control

- Prevention: Fennel colonizes sites with disturbed soils, so activities that cause soil disturbance should be revegetated with native species as soon as possible, particularly in chaparral habitats (Holloran et al. 2004). Managing areas to minimize soil disturbance can help prevent the establishment, or control the spread, of this species.
- Mechanical: Mechanical removal of this species is most successful when the plants are young and have not developed a large taproot. Small seedlings or individual plants in small infestations can be removed when the soil is moist, using soil knives or trowels for seedlings and shovels or hand picks for larger plants with established taproots. For larger or denser infestations, frequent, repeated mowing every three months for approximately four years is often sufficient to reduce or eradicate fennel (Holloran et al. 2004). Infestations should not be mown during seed set, as this facilitates spread by seed. Burning followed by herbicide treatments for two years can also control or eradicate fennel infestations.
- Fire Management: Fall burning followed by herbicide treatments for two years can also control or eradicate fennel (DiTomaso and Healy 2007).
- Biocontrol: No known biocontrol agents provide safe or effective treatment of fennel infestations. Cattle will graze younger leaves but avoid the plant as the foliage matures later in the season.
- Herbicide: A 2% glyphosate solution can be applied as a foliar spray in grassland environments after seedlings germinate and/or older plants re-sprout from the rootstock in spring. However, this method may affect other native vegetation that co-occurs with the infestation and should be used with care. Herbicidal treatments are often used in concert with mechanical or burn methods, and some experts recommend mowing, waiting for seedlings and re-sprouts to emerge, and following with a foliar spray (Holloran et al. 2004). For infestations near wetlands or aquatic habitats, only herbicides specifically approved for use in these sensitive habitats should be applied.

Perennial Pepperweed (*Lepidium latifolium*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: B
Observed within Survey Area: Yes, observed in the new 230 kV circuit corridor.

Ecology

Perennial pepperweed is a perennial herb in the Mustard Family (*Brassicaceae*). It typically grows on moist or seasonally wet sites (DiTomaso and Healy 2007). Preferred habitats include non-crop areas such as wetlands, riparian areas, meadows, vernal pools, salt marshes, flood plains, sand dunes, roadsides, and irrigation ditches, as well as ornamental plantings and agronomic crops, including alfalfa, orchards, vineyards, and irrigated pastures. It blooms from May to September and grows very aggressively, forming dense colonies that exclude native species, up to 7,220 feet in elevation. It reproduces both by seed and vegetatively from its roots and small root fragments. Perennial pepperweed is a state-listed noxious weed in California and many other western states (Cal-IPC 2008).

Control

- Prevention: Prevention of perennial pepperweed infestations is best accomplished through application of appropriate BMPs designed to reduce the spread of propagules, either seeds or root fragments, from infested areas. Any construction equipment used in an area supporting perennial pepperweed should be well cleaned before being used in another area. Similarly, hay, crops, and fill soils should not be harvested or exported from an area infested by this species.
- Mechanical: Unless dealing with a small infestation, plants should not be pulled by hand. Repeated mowing, grazing, or even burning without concurrent implementation of other measures is also often ineffective (DiTomaso and Healy 2007). To prevent re-sprouting from roots, mowing treatments can be followed by covering the root system with cardboard or landscape cloth. Alternatively, mowing can be used if timed correctly and followed with herbicides as described below. First, plants should be mowed as close to the ground as possible as soon as flowers appear in spring, then mowed again when re-sprouts produce more flowers, before seed has been set in both cases. Herbicide application is subsequently required (Holloran et al. 2004; DiTomaso and Healy 2007).
- Cultural: Competitive species should be planted into areas desired for recovery, followed by repeated applications of selective herbicides to help control the peppergrass while the desired species establish (Zouhar 2004).
- Biocontrol: No known biocontrol agents provide safe or effective treatment of pepperweed infestations. Sheep and goats will graze this species if other food is not available, but this is not an effective method of control due to clonal reproduction and re-sprouting from the root system.
- Flooding: One promising treatment for this wetland invader, when feasible, is long-term flooding of infested areas. Perennial pepperweed is adapted to seasonal hydrology and does not tolerate soils saturated for a long duration. However, if native plants are still present on-site, these may also be adapted to seasonal hydrology and could be negatively affected.
- Herbicide: Mowing is most effective when followed by herbicide treatment, but do not apply herbicide to non-mowed plants because perennial pepperweed leaves produce a thick waxy coating that prevents foliar uptake. Instead, herbicide should be applied directly after the second mowing as described above. When working in or near wetlands, only herbicides specifically approved for use in these sensitive habitats should be used.

Himalayan Blackberry (*Rubus discolor*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: Unrated
Observed within Survey Area: No, not observed during the BRRTP weed surveys. However, it is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Himalayan blackberry grows just about anywhere there is water or seasonal water in elevations up to 5,210 feet in elevation. It can also grow along objects such as fences and buildings, but is more common in riparian areas. Himalayan blackberry has been known to colonize initially disturbed areas that have been neglected by humans and, if not controlled, dominate lands due to its strong competitive abilities. It can out-compete native plant species rapidly and can also hinder wild animals from gaining access to water ways (Bossard, Randall, and Hoshovsky 2000).

Control

- Prevention: There are no known land management practices that would discourage establishment of Himalayan blackberry that do not also discourage the establishment of favorable native bramble species. However, removal of small, initial infestations is the best method to prevent the development of large monocultural stands that are typically difficult to eradicate.
- Mechanical: Cutting stems can be an effective mode of removal, but as this species has several methods of vegetative reproduction, purely mechanical eradication means can be problematic. Stems should be cut with a chainsaw, scythe, or tractor-mounted mower followed by the removal of as much underground tissue as possible, which can be prohibitively labor-intensive in large infestations. While cutting does not stimulate lateral root sprouting, stems will re-grow from root crowns. Large, older root crowns are often difficult or impossible to remove completely. As plants can reproduce from cut primocanes, slash piles should be burned. As with most mechanical control methods, success is often achieved only after several sequential cuts that exhaust the plants' resources. Optimal timing for cutting is just after the commencement of flowering.
- Fire Management: Burning can be an effective means to control large thickets, but as fires do not kill underground tissues, re-sprouts require follow-up mechanical or herbicidal control. Slash burning as described above will prevent the establishment of new infestations from re-rooted primocanes.
- Biocontrol: The USDA has not supported research on insect biocontrol agents for this species due to the large number of commercially important *Rubus*-based crop berries (Bossard et al. 2000). However, a fungal rust (*Phragmidium violaceum*) was discovered in Oregon in 2005 that may eventually provide effective bioagent-based control in California (DiTomaso and Healy 2007). Additionally, although the spiny plants are usually avoided by large livestock, the foliage provides year-round, palatable forage, and goat and sheep herds have been successfully used to control re-sprouting following other control methods, to manage the spread of large infestations, and reclaim or prevent further spread into pastures (Bossard et al. 2000).
- Herbicide: Mechanical control methods, such as cutting, are most effective if immediately followed by herbicide application. Some researchers report that herbicidal methods are the most effective means of control (DiTomaso and Healy 2007), but caution should be used due to the species' tendency to infest riparian areas. Only herbicides specifically approved for use in aquatic and wetland habitats should be employed in control efforts for this species in riparian habitats, and care should be taken to minimize damage to native aquatic and emergent vegetation through careful application. Some herbicides that have been found to be highly effective in controlling Himalayan blackberry are glyphosate, picloram + 2,4-D, triclopyr ester, or triclopyr amine (Tirmenstein, 1989).

Spanish Broom (*Spartium junceum*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: C
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a.

Ecology

Spanish broom is a yellow-flowered shrub in the Pea Family (*Fabaceae*) with many long, straight, dark green stems. It is widespread in drier coastal and interior regions of California up to 1,950 feet in elevation. The long-lived shrubs reproduce from abundantly produced seed, which remain viable for at least five years. Spanish broom invades open sites on hot, dry hillsides, especially in chaparral areas. Spanish broom rapidly develops dense colonies that prevent establishment by native shrubs. These stands are considered a fire hazard and are of little value to wildlife (Nilsen 2000).

Control

- Prevention: Minimization of soil disturbance, followed by immediate revegetation of any areas that must be disturbed through temporary impacts, is the best way to prevent infestation by Spanish or Scotch broom (*Cytisus scoparius*). Areas where temporary grading impacts have occurred should be monitored until successfully revegetated to catch initial colonizers, which should be manually removed as described below. Once a large population is established, eradication is very difficult due to the large, long-lived seed bank that develops (DiTomaso and Healy 2007). However, careful removal of initial colonizers as described below can help prevent the formation of a colony.
- Mechanical: Remove individual plants in late winter to spring when the soil is moist and plants are most easily removed from the soil, using a weed wrench or similar tool to get as much taproot as possible. This is most efficient when removing the initial colonizers of an area to prevent a large infestation, but once a large infestation is present, spring hand pulling of successive generations is still thought to be the most effective method of control (Holloran et al. 2004). Untreated cut stems will re-sprout, and will require repeated cutting unless treated, although in medium to large shrubs, re-sprouting can be reduced by removing all of the bark from the cut stump down to ground level. Wherever mature plants are removed by pulling or cutting, seedlings will have to be treated for at least the following five to eight years to prevent a recurrence of the infestation. Seedlings should be raked with a Hula Hoe soon after germination or flamed with a propane torch.
- Fire Management: Burn-based control methods is not recommended for this species, due to the danger of fire spreading to tree canopies.
- Cultural: Some research suggests that planting tall shrubs or trees in or near populations of Spanish broom may reduce their photosynthesis and help control their populations, while other research suggests that Spanish broom is an early successional plant and may be replaced by later seral vegetation if left alone (Zouhar 2005).
- Biocontrol: Three species of biocontrol insects have been released to control Spanish broom, but these have so far been ineffective in achieving control of infestations (DiTomaso and Healy 2007). Grazing is not typically an effective means to control Spanish broom, although if goats are confined to a small enough area following a cutting treatment, they can remove re-sprout growth as it occurs (DiTomaso and Healy 2007).
- Herbicide: Applying herbicide to fresh wounds following cutting can reduce the degree of re-sprouting, but will not prevent new generations of seedlings from germinating each year. Plants will require treatment for a period of several years for herbicide treatments to be effective. There is also a risk of affecting non-target species as well.

Tamarisk/saltcedar (*Tamarix ramosissima*)

Status

Cal-IPC Inventory Rating: High
CDFA Pest Rating: B
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a and the reconductoring corridor.

Ecology

Saltcedar is a deciduous shrub or a tree in the Tamarix Family (*Tamaricaceae*) that can be found along streams and lake shores throughout California. It is associated with dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity (Cal-IPC 2008). The plant can use both groundwater and surface water, and has an extensive deep root system, both of which aid it in decreasing the local water table. The plant also extracts salts from the deep soil layers and excretes them on its leaves, which when falling, increase the soil surface salinity and inhibit native species growth. Saltcedar prefers habitats such as river, lake, and pond margins, washes, roadsides, ditches, flats, sand dunes, and desert springs. It grows best in an alkaline soil, but tolerates salinity and acidity. Mature plants can survive desert heat, below-freezing temperatures, periodic flooding, drought, and burning. The plants reproduce by seed and sometimes vegetatively from root sprouts and stem fragments, and can grow to 2,625 feet in elevation (DiTomaso and Healy 2007).

Control

- Prevention: Sites with intact native riparian vegetation are resistant to tamarisk invasion because the seedlings are poor competitors. Minimizing impacts in riparian and desert wash habitats and restoring any necessary impacts with native vegetation will thus reduce the potential for tamarisk invasion into new areas.
- Mechanical: Trees cut from the soil surface re-sprout from the root system. Aboveground tree removal should be followed with herbicidal methods as outlined below; otherwise, the root system will need to be manually removed, which may cause more soil disturbance than necessary and leave the site open to new invasions. Seedlings and small plants must be removed during the first year after removal of mature plants, which are easily removed by hand (DiTomaso and Healy 2007).
- Fire Management: Burning is not recommended because plants re-sprout readily following fire.
- Cultural: Mature saltcedar is vulnerable when shaded and, if possible, saltcedar-susceptible sites should be revegetated with native trees to discourage its reestablishment (Zouhar 2003). However, because many sites near dams, diversions, groundwater pumping, and development have resulted in reduced soil moisture, increased depth to the water table, and increased soil salinity, planting native trees may not be feasible. In these cases, salt-tolerant grasses may be more appropriate for revegetation.
- Biocontrol: In 2002, the saltcedar beetle (*Diorhabda elongata*) was released in efforts to control tamarisk, but it is not yet known how effective the species will be in control of saltcedar (DiTomaso and Healy 2007).
- Herbicide: Cut stumps should be painted with an herbicide preparation specifically approved for use in aquatic and wetland ecosystems in California. Care should be taken to use a strong enough application to kill the root crown bud. Repeat applications are required the following year when seedlings germinate in the spring. Young plants are easily scraped with a Hula Hoe or pulled by hand.

2.2.2 Moderate Risk Noxious Weed Species

These species have clear impacts on physical processes, plant and animal communities, and vegetation structure of the communities in which they establish, but impacts are less severe than the species listed as high risk. They generally experience moderate to high dispersal rates, with their establishment success dependent on ecological disturbance. Ecological amplitude and distribution may range from restricted to extensive.

Eupatory (*Ageratina adenophora*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: No, not observed during the surveys. However, it is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Eupatory is a perennial herb or small shrub in the Sunflower Family (*Asteraceae*). Eupatory is found along the coast of California and in the South Coast and Transverse Ranges up to 970 feet in elevation (Cal-IPC 2008). This species prefers disturbed areas, coastal canyons, riparian areas and scrub, and is especially invasive in mild coastal areas (Cal-IPC 2008). Eupatory was originally introduced to California as an ornamental plant, but the species escaped from cultivation by producing abundant seed that is dispersed via wind, water, soil movement, and by clinging to animals and people (Cal-IPC 2008).

Control

- Mechanical: Small infestations can be controlled by hand-pulling plants, as long as care is taken to remove the crown and rootsock as well, which can cause the growth of new shoots if not removed (DiTomaso and Healy 2007).
- Fire Management: Prescribed burns are not recommended unless the burned area will be revegetated. Openings of bare ground may encourage germination and establishment of eupatory (DiTomaso and Healy 2007).
- Biocontrol: Stem-gall flies (*Procecidochares utilis*) have been successfully used to control eupatory (Kluge 1991). By repeating treatment enough to restrict vegetative and reproductive development through the formation of galls by the larvae, the plants can eventually be killed. This has been found to be less successful in damp habitats, but was a highly successful treatment method in Hawaii.

Tree-of-heaven (*Ailanthus altissima*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: C
Observed within Survey Area: No, not observed during the 2008 weed surveys. However, it is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Tree-of-heaven is a deciduous flowering tree of the Quassia Family (*Simaroubaceae*). It is widely distributed in coastal and interior California up to 4,100 feet in elevation, and is especially abundant along streams and in other moist habitats. Tree-of-heaven spreads rapidly from root sprouts and also reproduces from its abundantly produced wind-blown seeds (Hunter 2000). Root suckering can spread one individual over an area of one acre or larger, and a single tree can produce over one million seeds in a year (Hunter 2000). Tree-of-heaven spreads rapidly in riparian and other wetland sites, crowding out native vegetation. Once established, it persists for many years.

Control

- Prevention: While it is difficult to prevent initial colonization by seeds, which may enter an area through wind dispersal, the main method of reproduction in California is by vegetative reproduction. Slash piles created after cutting tree-of-heaven to control infestations should be burned or periodically rechecked to pull new saplings that can establish from cut stem fragments.
- Mechanical: Stems should be cut to remove all vegetative tissue in late spring to cause the most stress to plants, which will re-sprout from the cut stem as well as produce new individuals through root suckering. Young saplings can be hand-pulled, when the soil is moist, in an attempt to remove the taproot, but this will not work in older, larger individuals. Cut stems will require repeated treatments over a period of at least two years to completely exhaust the resources needed to re-sprout or produce suckers. Do not girdle trees as this encourages extensive suckering from the root system. Immediate treatment of cut stumps as described below is most effective in prevention of re-sprouts.
- Fire Management: Fire is mostly ineffective in controlling against tree-of-heaven infestations, but may be useful for spot treatments, although tree-of-heaven may re-sprout after heat-girdling from

burns (Howard 2004). Fire management is not recommended because of this threat of causing new sprouting, particularly with the influx of nutrients that occurs after fires.

- Biocontrol: Tree-of-heaven is generally resistant to insect damage, and is even cultivated for use in silk production. Grazing is ineffective, and wildlife do not typically browse new shoots.
- Herbicide: Immediately following the late spring stem cut, apply a 50% solution of glyphosate to the cut wounds using a paintbrush, taking care to protect native vegetation from the herbicide. Application in the late spring coincides with the most effective time to cut, and has the added benefit of being readily translocated to the root system at this time of year (Holloran et al. 2004; DiTomaso and Healy 2007).

Slender Wild Oat/Wild Oat (*Avena barbata*)/(*Avena fatua*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, both observed on Alternatives 2, 2a, and 3, the reconductoring corridor and the new 230 kV conductor corridor.

Ecology

Slender wild oat is a winter annual grass (*Poaceae*) that grows in nearly every grassland area of California. It does well in sandy and poor soils, often on the road verges. It is one of the annual grasses that was introduced as a forage species and has replaced the native perennial grasses (Cal-IPC 2008). The plant reproduces by seed. Preferred habitats include grassland, oak-savannah, fields, roadsides, pastures, crop fields, previously cultivated fields, orchards, vineyards, gardens, and other disturbed places. Slender wild oat grows to 3,940 feet in elevation (DiTomaso and Healy 2007).

Control

- Mechanical: Pull, hoe, or dig out wild oat in the early spring when the plants are still small and have not set seed, as seeds can remain dormant for up to ten years in the soil once fallen (ESNERR 2000). Solarization and mulching can suppress seedling germination if necessary.
- Fire Management: Multiple burn treatments have been found to reduce abundance of *Avena*, but these can result in increases in non-native forb species (Parsons and Stohlgren 1989).
- Cultural: A thick layer of mulch can be used to suppress establishment of these species on non-crop and agricultural sites (DiTomaso and Healy 2007). Contrarily, cultivation and soil disturbance may stimulate their growth.
- Herbicide: It is recommended that a pre-emergence product containing EPTC, oryzalin, or trifluralin is used in the fall (ESNERR 2000). For grasses growing among broad-leafed plants, selective post-emergence herbicides containing fluazifop-butyl or sethoxydim can be used. Nonselective herbicides containing glyphosate or glufosinate-ammonium will also kill wild oat.

Ripgut Brome (*Bromus diandrus*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a, the reconductoring corridor and the new 230 kV conductor corridor.

Ecology

Ripgut brome grows in open disturbed areas, roadsides, fields, ranges, and agronomic crops, orchards, forestry sites, and many natural plant communities in California and elsewhere at elevations up to 6,560 feet. It grows in most soil types (DiTomaso and Healy 2007). Ripgut brome competes with other plants for water and nutrients, often establishes dense stands, and hosts various plant diseases; however, it generally does not form exclusionary monocultures. It has high water use efficiency to allow late season growth, and it produces abundant potential fuel which can increase frequency or severity of fires (Cal-IPC 2008). Ripgut brome spreads in desert scrubland, as well as the pinyon pine-juniper communities and three-needle pine woodlands. Since the species is highly flammable when dry and is currently increasing the frequency and spread of wildfires in certain communities, it is contributing to the conversion of desert woodlands and scrublands into annual grassland. The species can be good livestock forage only while immature, but prevents establishment of alternate forage grasses (DiTomaso and Healy 2007).

Control

- Prevention: Proper stocking levels and the protection of soil resources are the best known land management practices preventing the establishment and spread of cool-season annual grasses in California. However, preventing the spread or eradicating these grasses is difficult. The majority of grasslands within the state are now dominated by these and other exotic annual grasses.
- Mechanical: Few mechanical methods are suitable or effective in annual *Bromus* control. Precisely timed mowing, after the grass has begun to flower but before it has produced mature seeds (a period of about a week), can help reduce the amount of seed produced each year. In agricultural areas, intensive or deep tilling can help eradicate infestations.
- Fire Management: Burning tends to promote the establishment, growth, and spread of these grass species. Late season burns can significantly increase *Bromus* densities in subsequent years (DiTomaso and Healy 2007). Some practitioners have advocated burning sites after seed is set but before the plants shatter, which reduces the amount of viable seed. However, like other burn control methods, this appears to increase the site's susceptibility to subsequent invasions (DiTomaso and Healy 2007), and therefore is not recommended.
- Biocontrol: Overgrazing may increase the abundance of ripgut brome by reducing the abundance of more desirable species (DiTomaso and Healy 2007).
- Herbicide: No herbicidal methods are currently a good option for annual *Bromus* grass control, due to the extensive nature of many infestations. As the grasses become dominant species in the habitats they invade, targeting specific areas for eradication without affecting other co-occurring native species is difficult.

Tocalote (*Centaurea melitensis*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: C
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a and the reconductoring corridor.

Ecology

Tocalote is a yellow-flowered winter annual in the Sunflower Family (*Asteraceae*) that is widespread along roadsides and in other disturbed sites up to 7,170 feet in elevation in Southern California. Tocalote is less common in northern California. The growth pattern of tocalote is somewhat similar to yellow star-thistle, but flowering occurs earlier in the year. Tocalote produces a rosette in the early part of the growing season, then bolts and flowers in late spring or early summer. Tocalote reproduces only from seed, and individual plants can produce as many as 60,000 seeds (DiTomaso and Gerlach 2000).

Although tocalote can displace natives and adversely impact rare plants in coastal areas, adverse ecological impacts from tocalote infestation have not been reported for montane habitats in California.

Control

- Prevention: When working in areas infested with tocalote, equipment (including undercarriages) should be carefully cleaned before moving to a non-infested area. The collection and export of fill soils, pasture hay, and crops from infested areas should be avoided or minimized to the maximum extent practicable.
- Mechanical: Mowing can provide effective treatment of infested areas if mowed at the correct time, which is immediately after the earliest 2% to 5% of plants have begun to produce flower heads, usually in April or early May (DiTomaso and Healy 2007). Mowing too early may cause plants to become bushier and produce more flower heads. Treatments should continue for at least two to three years, after which spot eradication may be required indefinitely.
- Fire Management: Prescribed burning of tocalote can reduce populations if timed correctly, but to avoid heavy damage to native vegetation, burns should be timed to occur after other annual plants have dried but before tocalote seeds are produced. Due to its late spring-early summer flowering period, burning may be difficult to implement for tocalote. However, an experimental study showed that during three years of prescribed fires, non-native forb biomass increased 18,000% from pre-burn levels and was largely composed of tocalote, which went from non-existent in pre-burn plots to comprising 46.3% of total biomass three years later (Parsons and Stohlgren 1989), suggesting that fire management of tocalote may provide mixed results of success.
- Cultural: DiTomaso and Healy (2007) suggest that cultural strategies used for control of yellow star-thistle (see above) may be effective for tocalote as well.
- Biocontrol: Responsible rangeland management, where range is grazed by sheep, goats, or cattle to a moderate degree, can help prevent establishment or spread of populations in grasslands. Infested areas can be treated by high-intensity grazing between the period when the plant bolts (April) to just before the plant produces spiny seed heads in May/June. Biocontrol insects used to control yellow star-thistle may also feed on tocalote flower heads, but are more attracted to, and better at damaging, yellow star-thistle.
- Herbicide: Herbicide treatments by foliar spray or wick application are generally used to control or reduce spot infestations, or as follow-up to more intensive mechanical, grazing, or fire management-based treatments.

Bull Thistle (*Cirsium vulgare*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: C
Observed within Survey Area: No, not observed during the BRRTP weed surveys. However it is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Bull thistle is a spiny pink-flowered biennial thistle in the Sunflower Family (*Asteraceae*) that is widespread in California in mesic coastal and montane habitats below 8,000 feet in elevation. It is common in moist grasslands, meadows and forests (Randall 2000). Bull thistle reproduces from seed, which remains viable for three years or more and is capable of wind-dispersal for distances of more than a mile. It rarely forms dense stands, but can be abundant enough to displace native plants including forage species important to native herbivores (Randall 2000).

Control

- Prevention: The best preventative measure is removal of small infestations as soon as possible after they are located. If mowers, vehicles, or tillage equipment are operating in an infested area, they should be thoroughly cleaned afterward to prevent the spread of the infestation (Zouhar 2002). When establishing vegetation on a site, certified weed-free seed and mulch should be used for any seedings, and sites should be monitored several times a year, particularly in areas that are most susceptible to the spread of weeds, such as roadsides, parking lots, fencelines, and waterways.
- Mechanical: Bull thistle can be hand pulled prior to flowering, by bending the stem and pulling. Use a pick to loosen hard soil and pull the taproot. Bull thistle can also be cut or mowed shortly before flowering (DiTomaso and Healy 2007). Cut the stem a minimum of one to two inches below the ground with a shovel. If mowing, cut close to the ground just before flowering. A follow up mowing one month later is often needed (Holloran et al. 2004). Stems can be left to decompose on-site, although flower heads should be removed. Cut flower heads should be bagged, as they may still produce viable seed (Bossard et al. 2000; DiTomaso and Healy 2007; Holloran et al. 2004).
- Cultural: Cultivation before flowering can help to control bull thistle infestations (DiTomaso and Healy 2007). Sites where bull thistle has been pulled from the ground should be revegetated with desired plants to provide competition in the event that there are still bull thistle seeds left in the soil (Zouhar 2002).
- Biocontrol: The USDA has approved two insect species for bull thistle control in California, although neither has been successful. *Rhinocyllus conicus* is a weevil that attacks *Cirsium*, *Carduus*, and *Silybum* species; however, it has also been known to attack native *Cirsium* species. *Urophora stylata* is a gall-forming fruit fly that may be useful in coastal sites (Bossard et al. 2000).
- Herbicide: Autumn or spring application of 2,4-D at 0.5 kg/ha is recommended to control rosettes (Bossard et al. 2000). Other appropriate herbicides for the control of bull thistle are clopyralid, dicamba, MCPA, picloram, metsulfuron, and chlorsulfuron (Zouhar 2002), although herbicide use may also affect non-target plant species as well.

Artichoke Thistle (*Cynara cardunculus*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: B
Observed within Survey Area: No, not observed during the surveys, but is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Artichoke thistle is a perennial thistle in the Sunflower Family (*Asteraceae*) which blooms from April to July. This is a large thistle that is closely related to cultivated artichokes and can grow to nine feet tall (DiTomaso and Healy 2007). This species is found throughout California with an elevation range up to 1,600 feet in elevation (Cal-IPC 2008). Artichoke thistle likes disturbed open sites, preferring habitats such as grassland, chaparral, coastal scrub and riparian areas. This species is sometimes grown as an ornamental plant. This species will reproduce by seed and sometimes re-sprout from root fragments (Cal-IPC 2008).

Control

- Mechanical: In small or scattered populations, grubbing may be a practical deterrent if the taproot is removed or the seedhead is cut and removed (Kelly 2000). Methods such as disking or plowing are not recommended because it not only requires several years to effectively eliminate the plant from the area, but because the root reaches up to eight feet in depth and the soil disturbance makes it possible for further infestation to occur. Flower stems should be cut before maturity to reduce seed production (DiTomaso and Healy 2007).

- Fire Management: Prescribed burns would help remove the aboveground biomass of the plant, possibly killing the surface layer of the seedbank and making chemical control methods more effective. Plants in burned areas should be chemically treated four to six weeks after they resprout. Burning will not kill the taproot of the plants (DiTomaso and Healy 2007).
- Cultural: Repeated cultivation may eventually eliminate artichoke thistle populations (DiTomaso and Healy 2007).
- Biocontrol: Invertebrates such as earwigs, ants and other aphids, harlequin beetles, and bees feed on artichoke thistle. Although there are no USDA-approved biocontrol agents for this plant, the exotic Mediterranean Basin-based artichoke fly (*Terellia fuscicornis*) feeds on flowers and seedheads. Wildlife do not cause a significant impact to artichoke thistle populations, although DiTomaso and Healy (2007) report that browsing by goats may reduce seed production.
- Herbicide: The "cut-stump" method has been reported as being effective against artichoke thistle populations. The cut-stump method involves cutting the plant as close to the base as possible and applying a solution of 25 percent glyphosate (Roundup®) to the stump. Mature, bolting plants can be killed with a two percent glyphosate solution with a 95% to 98% success rate. This is also effective on plants that have gone to seed and on seedlings, but not usually in the earlier stages of growth before the plant sends up a flower stalk, likely because in pre-bolting plants the movement of fluids is greater towards the leaves and stems, and lesser towards the roots. Using power tools or tractors to cut down the plants increases the effectiveness of chemical treatment. The herbicide Clopyrlid (Transline®) can be effective when applied during the rosette stage, but less effective on mature, bolting plants.

Shortpod Mustard (*Hirschfeldia incana*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a and the reconductoring corridor.

Ecology

Shortpod mustard is a biennial or short-lived perennial forb in the Mustard Family (*Brassicaceae*) that reproduces by high seed production. It is native to the Mediterranean region and is becoming an increasing problem in wildlands of Southern California (Cal-IPC 2008). It blooms from May to October up to 5,250 feet in elevation; habitat includes disturbed areas, roadsides, fields, pastures, agronomic crops, orchards, vineyards, ditch banks, and dry washes (DiTomaso and Healy 2007).

Control

- Prevention: Disturbance and fire favor establishment of mustard species. Additionally, shortpod mustard may be more likely to invade areas already dominated by annual grasses (Brooks 2004). Therefore, protection and sound management of remaining bunchgrass grasslands and quick eradication of initial infestations in scrub- or woodlands is recommended.
- Mechanical: Black and shortpod mustard are best controlled mechanically by hand-pulling of plants each year after they have bolted but before they produce seed. The plants have a fairly weak root system, and as annuals, do not re-sprout from root fragments left in the soil. Over time, this can deplete the seed banks and allow native or grassy vegetation to dominate previously infested areas (DiTomaso and Healy 2007). Mowing, particularly when timing is poor, can produce plants that branch heavily from the base, and could produce even more seed than undisturbed plants.

- Fire Management: Burning is not recommended for shortpod mustard control as it can damage co-occurring native vegetation due to heavy fuel loads, as well as the fact that shortpod and other exotic mustard species appear to be somewhat fire-adapted and can increase in density following fires.
- Herbicide: Because early season mustards such as these emerge early in the growing season, often before native vegetation has broken dormancy, it is thought that early post-emergence herbicidal treatments may be effective for members of this group (Bossard et al. 2000), but more research is needed to develop a standardized, optimized methodology for control of these species.

Tree Tobacco (*Nicotiana glauca*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: No, not observed during the surveys, but is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Tree tobacco is a tree/shrub in the Nightshade Family (*Solanaceae*), which grows up to 10 to 20 feet in height, and is short-lived. Tree tobacco was introduced to California about 100 years ago and is found growing up to 5,000 feet in elevation in disturbed soils, vacant lots, along roadsides, streamsides, and riparian areas (Cal-IPC 2008). All plant parts contain the alkaloid anabasine and are highly toxic to humans and livestock when ingested. The plant flowers from March to November and reproduces by seed. It grows throughout California, including the southwestern region and in deserts up to 3,610 feet in elevation (DiTomaso and Healy 2007).

Control

- Prevention: In Australia, it has been observed that stem densities are significantly reduced in non-grazed plots, possibly due to the competition from native wetland vegetation (Florentine and Westbrooke 2005). As wetland areas are often grazed heavily by livestock in arid areas, protection of native emergent wetland vegetation by excluding livestock from sensitive areas may prevent seedling establishment or spread of existing infestations.
- Mechanical: No mechanical methods of control other than hand-pulling are known, although cutting before herbicide application is an accepted control method for many weedy, woody species.
- Herbicide: Optimal methods for control are still being developed, but glyphosate applied as foliar spray, drizzle, or as a treatment to cut-stumps all showed high levels of initial success when applied in fall (Oneto et al. 2004), although later regrowth was not assessed and other timing regimes were not compared in the 2004 publication.

Tumble mustard (*Sisymbrium altissimum*)

Status

Cal-IPC Inventory Rating: Unrated
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 1, 2, and 2a, the reconductoring corridor, and the new circuit corridor.

Ecology

Tumble mustard is a winter annual or biennial in the Mustard Family (*Brassicaceae*) that is widespread throughout most California counties (Howard 2003, Calflora 2011). It easily grows in many soil types, including loose to compact soils, and on sand, disturbed roadsides, and in fields (Hickman 1993, Howard 2003). Some of the more common vegetation types that it can be found in include sagebrush, salt-desert shrubland, and pinyon-juniper communities (Howard 2003). In California, it is known to occur at elevations below 8,200 feet and typically flowers between March and April (Howard 2003). It is an important source of food for many types of livestock, game, small mammals, and birds, especially in its early stages before seeding (Howard 2003). Because tumble mustard is an early seral species, in late seral stages of vegetation communities it may be excluded by increasing canopy closure, ground litter, or increased competition from late-successional species (Howard 2003).

Control

- Prevention: Establishment of tumble mustard can be minimized or prevented by minimizing soil disturbance and seed dispersal and keeping a high native species cover (Howard 2003).
- Mechanical: Manually removing rosettes in the fall or early spring can control small infestations (Howard 2003).
- Fire: Fire has not been demonstrated to be an effective control method for tumble mustard, and it may instead increase in abundance in the early postfire community if other species are slow to establish on the open ground (Howard 2003).
- Biocontrol: Native and introduced slugs have been shown in trials to have an affinity for tumble mustard over 18 other early successional species (Howard 2003).
- Herbicide: Herbicides can be effective in helping to control populations of tumble mustard, but are not usually a long-term solution unless implemented with other methods of control and management. The most effective herbicides include 2,4-D and MCPA, although bromoxynil, atrazine, and chlorsulfon are also effective control measures (Howard 2003).

Rat-tail Fescue (*Vulpia myuros*)

Status

Cal-IPC Inventory Rating: Moderate
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a, the reconductoring corridor and the new 230 kV circuit corridor.

Ecology

Rat-tail fescue is a cool season annual in the Grass Family (*Poaceae*) found in numerous California counties. It is the one of the most widespread non-native annual grasses, having naturalized throughout much of California. It readily tolerates drought, some shade, and poor, shallow, sandy and acidic soils, and is considered to be a poor forage grass for livestock (Cal-IPC 2008). Preferred habitats include disturbed and undisturbed open areas, including dry and seasonally wet sites, roadsides, rangeland, pastures, fields, occasionally agronomic fields, grassland, slopes, washes, and open areas in many plant communities, including chaparral and open woodland. It reproduces by seed and grows to elevations of 6,560 feet (DiTomaso and Healy 2007).

Control

- Mechanical: Hand-pulling may reduce cover of small populations or in smaller sites such as vernal pools (Howard 2006).
- Fire Management: Prescribed burns in tandem with hand-pulling have been found to be effective on control of rat-tail fescue.

- Biocontrol: Rat-tail fescue generally thrives in areas that are heavily grazed. However, it has also been shown that timing heavy grazing to a few weeks in spring to reduce seed production and in fall to limit seedling survival can have substantial effects on controlling populations (DiTomaso and Healy 2007).
- Herbicide: Application of glyphosate to rat-tail fescue has been found to be effective when conducted after annual grass seedlings emerge but before native seedlings emerge (Howard 2006). Simazine has also been found to be an effective herbicide.

2.2.3 Lower Risk, Poorly Known, or Native Invasive Species

These species have minor impacts on a statewide level than either the high or moderate risk species. In some cases there is not enough information known about the species to justify an elevation into either of the other categories. They generally experience low to moderate dispersal rates, and although their ecological amplitude and distribution may be limited, these species may still be problematic on local levels. However, some species in this category, such as annual grasses, may cause drastic vegetation type conversion due to their high dispersal rates and other characteristics, but may be present in such amounts as to make eradication or even control beyond feasible.

Soft Chess (*Bromus hordeaceus*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a, the reconductoring corridor and the new 230 kV circuit corridor.

Ecology

Soft chess is a cool season non-native annual grass that commonly grows throughout California at elevations up to 3,280 feet and sometimes up to 6,900 feet. It thrives on fertile or non-fertile soil and blooms from April to July. Habitats include grassland, sagebrush communities, rangeland, fields, open disturbed sites, roadsides, orchards, vineyards, and agronomic crops. It is uncommon in desert areas. Soft chess has a low forage value, but can be desirable livestock forage, both while immature and mature. However, it competes for moisture with native grasses that would provide forage later into the season (DiTomaso and Healy 2007).

Control

- Fire Management: Prescribed burns in the fall have been successful at reducing coverage in some cases (Howard 1998). Seeds are not killed until the temperature is approximately 200 degrees Fahrenheit or above.
- Biocontrol: Spring grazing may partially control soft chess infestations. Defoliation within the first week after flowering has proven effective in reducing seed formation, while removing terminal buds has been effective at preventing leaf elongation and seed production. Some studies have shown that a cessation of grazing has also caused annuals to decrease in cover relative to native perennials (Howard 1998). Yearly grazing at a moderate level combined with late summer burns every few years has also been shown to be effective at promoting establishment of native perennial grasses and the reduction in abundance of non-native annual grasses (DiTomaso and Healy 2007).

Crimson spot rockrose (*Cistus ladanifer*)

Status

Cal-IPC Inventory Rating: Unrated

CDFA Pest Rating: Unrated
Observed within Survey Area: Possibly. A species from the *Cistus* genus was identified on Alternatives 2 and 2a, and the reconductoring corridor.

Ecology

Crimson spot rockrose is a perennial non-native shrub in the Rockrose Family (*Cistaceae*) that occurs at elevations lower than 984 feet (Calflora 2011, NRCS 2011). It originated in southwestern Europe (Hickman 1993), and is present in herbaria within three California counties, including Los Angeles County (Calflora 2011). Although it can be found in disturbed areas, it is uncommon (Hickman 1993). The *Cistus* genus is composed of early successional species that are particularly adapted to fire (Bastida and Talavera 2002).

Control

There have been few studies conducted on effective control methods for crimson spot rockrose. It is possible that mechanical methods such as cutting or hand-pulling may assist in controlling populations, along with herbicide control. Because seeds of this species usually remain dormant in the absence of fire (Delgado et al. 2001), fire treatment can lead to seed germination and is not advised as a control method.

Blessed Thistle (*Cnicus benedictus*)

Status

Cal-IPC Inventory Rating: Unavailable
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed within the new 230 kV circuit corridor.

Ecology

Blessed thistle is a spiny-leaved non-native annual in the Sunflower Family (*Asteraceae*) that originated in Europe. It occurs sporadically on disturbed sites, in fields, and along roadsides in the North Coast Ranges, Central Valley, Central-western region, South Coast, and western Mojave Desert, to 2,625 feet in elevation (DiTomaso and Gerlach 2000).

Control

- Prevention: Blessed thistle is unlikely to become established in perennial pastures that are well-managed and maintained.
- Mechanical: Plants should be mowed just before the flower buds develop so as to prevent most of the seed production (DiTomaso and Healy 2007). Mowing earlier than this can cause the flower stems to regrow, whereas mowing after the flower heads have formed can still allow seeds to mature on the ground.
- Biocontrol: Grazing is not recommended, as livestock will usually graze other, more palatable plants besides blessed thistle, leaving less competition.

Filaree (*Erodium* sp.)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2, 2a, and 3 and the reconductoring corridor.

Ecology

Filaree species are aggressive annual/biannual in the Geranium Family (*Geraniaceae*). This genus is very widespread throughout California up to 6,520 feet in elevation and is commonly found along roadsides, grasslands, fields, and semi-desert areas. It often carpets large areas, out-competing native grasses and forbs (Cal-IPC 2008). Filaree species reproduce by seed. Most seeds are dispersed a short distance by explosive pods from the parent plant, but some seeds can disperse greater distances by clinging to animals and humans (DiTomaso and Healy 2007).

Control

- Fire Management: Prescribed burns can cause density to decrease, but biomass to increase during the first post-fire season (Howard 1992). However, after several years, filaree may decrease in size substantially. Grassland fires are not recommended for control, as they may actually aid in filaree's growth by removing the mulch layer that inhibits seed germination.
- Cultural: Planting crops that are highly competitive with filaree, such as wheat or barley, can help reduce its growth and its potential seed production (NBII & ISSG 2005).
- Herbicide: Filaree should be treated as early as possible, though chemical control is often unsatisfactory.

Prickly Lettuce (*Lactuca serriola*)

Status

Cal-IPC Inventory Rating: No List
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a and the reconductoring corridor.

Ecology

Prickly lettuce is an erect winter or summer annual, sometimes biennial, in the Sunflower Family (*Asteraceae*). It blooms from April to October and reproduces by seed. It is native to Europe, and a prolific colonizer of disturbed habitats throughout California up to 6,562 feet in elevation. Prickly lettuce prefers annual grasslands, roadsides, seasonal wetlands, waste places, ditch banks, fields, agronomic and vegetable crops, orchards, vineyards, landscaped areas, and urban places (DiTomaso and Healy 2007).

Control

- Mechanical: It is recommended that prickly lettuce be removed by pulling or hoeing the seedlings and mature plants before setting seed (ESNERR 2000; DiTomaso and Healy 2007).
- Fire Management: Prescribed burns are not recommended to eliminate prickly lettuce, and may actually lead to its proliferation. A prescribed fire experiment found that prickly lettuce, which had not been present in the burned area before the fire, was carried by the wind and became established in high numbers within two years after the fire (Lyon 1966). Another study found that after a three-year period, prickly lettuce was found in highest abundance in sites which were prescribed high-intensity burns, over those which were unburned or which received low-intensity burns (Gucker 2005).
- Herbicide: Pre-emergence herbicides containing isoxaben or post-emergence herbicides containing glufosinate-ammonium or glyphosate are recommended (ESNERR 2000).

Perennial Sweet Pea (*Lathyrus latifolius*)

Status

Cal-IPC Inventory Rating: Not Available
CDFA Pest Rating: Unrated

Observed within Survey Area: No, not observed during the surveys, but is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Perennial sweet pea is a glabrous perennial vine in the *Fabaceae* family. It is a garden ornamental that escaped cultivation in many areas of California. Preferred habitat includes roadsides, riparian areas, cereal crops, orchards, vineyards, and other disturbed places up to 6,560 feet in elevation. The plants are often vigorous and can form dense colonies, excluding native vegetation. Reproduction is by both seed and rhizome-like roots (DiTomaso and Healy 2007).

Control

- Mechanical: Perennial sweet pea can be controlled by cultivation, close mowing, or manual removal of stems before plants can set seed (DiTomaso and Healy 2007).

White Horehound (*Marrubium vulgare*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a, the reconductoring corridor and the new 230 kV circuit corridor.

Ecology

White horehound is an aromatic, cool-season perennial shrub/forb/herb in the mint family (*Lamiaceae*). This plant is native to Eurasia and is found heavily populating disturbed places throughout California in grasslands scrub and riparian areas up to 1,950 feet in elevation. It has mostly minor impact on native species (Cal-IPC 2008). White horehound is sometimes especially common in overgrazed areas; other preferred habitats include fields, roadsides, rangeland, disturbed natural areas, waste places, ditches, and other disturbed places. It most often grows in dry places, but does not grow in deserts. The plant flowers in spring/summer and reproduces by seed (DiTomaso and Healy 2007).

Control

- Prevention: The best preventative measure is removal of small infestations as soon as possible after they are located before they set seed.
- Mechanical: White horehound can be controlled through manual removal or cultivation; however, partially buried plants can survive.
- Fire Management: Burning can kill mature plants, but is known to stimulate seed germination for the following season.
- Biocontrol: The governments of Australia and Tasmania are experimenting with the horehound plume moth (*Wheeleria spilodactylus*) as a control agent (DPIW 2008). Sheep have also been used in the Monterey Bay area to control this species (ESNERR 2000).
- Herbicide: In Australia and Tasmania, Dicamba, MCPA amine, trichlopyr and 2,4-D are used to treat white horehound for spot spraying, repeat treatments, and aerial applications (NRMB 2008). Herbicide treatments are applied while the plants are actively growing. A surfactant must be added to assure wetting of the leaf surface. This species can take between 6 and 20 weeks show herbicide effects.

Yellow Sweetclover (*Melilotus officinalis*)

Status

Cal-IPC Inventory Rating: No List
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 2 and 2a and the reconductoring corridor.

Ecology

Yellow sweetclover is a biennial herb in the Pea Family that infests roadsides and other disturbed sites throughout California up to 4,890 feet in elevation. It has racemes of yellow flowers and cross-ribbed pods and reproduces only from seed. Individual plants are capable of producing thousands of pods, each bearing one or two seeds. They form dense monocultures in disturbed or open sites, but appear to be mainly early successional species that are rapidly displaced by late successional vegetation. Yellow sweetclover has been cultivated in the United States for use by livestock since at least 1856. Their nutritional properties are nearly as good as alfalfa, and they are fed to all classes of livestock. Documentation of significant ecosystem impacts from this species is lacking (Whitson [ed.] 2004).

Control

- Mechanical: Mowing or clipping plants in the summer will help control them as they flower, while hand pulling has also been shown to be successful in controlling small outbreaks (Tu et al. 2001).
- Fire Management: Prescribed burns should be carried out over two years to be most effective. Plants will increase in abundance during the first post-fire year, and should be burned again in late spring to kill the plants before they flower and set seeds. Burning during the dormant season may stimulate germination, and should be used in tandem with mechanical methods during the following summer.
- Cultural: Mulching has been found to be more effective than fire management methods.
- Biocontrol: Known pests to yellow sweetclover include sweetclover weevil (*Sitona cylindricollis*), grasshoppers, and cutworms (Sullivan 1992).
- Herbicide: The Nature Conservancy has used glyphosate to successfully control yellow sweetclover (Tu et al. 2001). Yellow sweetclover has been found to be susceptible to 2,4-D, dicamba, tordon, aflon, nevuron, and dalapon (Sullivan 1992).

Smilo grass (*Piptatherum miliaceum*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternatives 1 and 2a.

Ecology

Smilo grass is a perennial grass in the *Poaceae* Family that was introduced from the Mediterranean region (Calflora 2011). It occurs in dry or moist disturbed areas, especially along roadsides or in ditches, at elevations below 984 feet, and has been found in many counties in California (Calflora 2011, Cal-IPC 2011). Its presence has appeared to be increasing recently in riparian areas in Southern California (Cal-IPC 2011). It has been documented occurring in riparian areas, chaparral, coastal scrub, bare ground, oak woodlands, and other disturbed areas.

Control

There are currently no specific prescribed methods for controlling populations of smilo grass. Mechanical or herbicidal removal may prove effective, as may other methods of control for perennial grass species.

Rabbit Foot Grass (*Polypogon monspeliensis*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: No, not observed during the surveys, but is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

Rabbit foot grass is a winter or summer annual tufted grass in the *Poaceae* Family that can form dense stands in some areas of California. It is common in moist to wet areas (Cal-IPC 2008). Plants sometimes spread by stolons and appear to be perennial. Preferred habitats include moist to wet places, stream and pond margins, seasonally wet sites, ditches, pastures, and agricultural fields, moist sites in orchards and vineyards, and roadsides. Rabbit foot grass reproduces by seed and is common throughout California up to 6,890 feet in elevation (DiTomaso and Healy 2007).

Control

- Mechanical: Hand-pulling may reduce cover of small populations or in smaller sites, such as vernal pools (Howard 2006).
- Cultural: A research study has shown that rabbit foot grass may be able to controlled through the artificial elevation of soil salinity (Kuhn and Zedler 1997). The experiment demonstrated that a salt application of approximately 850 grams per square meter every month for three months was a sufficient amount to control the plant.
- Herbicide: A study in Arizona has suggested that rabbit foot grass may be controlled with Norflurazon (Zorial 5G®), showing a 66 – 85% success rate in controlling the plant in experimental plots (Knowles, et al. 1997).

Black Locust (*Robinia pseudoacacia*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes observed along the new 230 kV circuit corridor.

Ecology

Black locust is a deciduous flowering tree in the Pea Family (*Fabaceae*). It is widely distributed in coastal and interior California, and is especially abundant along streams and in other moist habitats up to 6,190 feet in elevation. Black locust reproduces mainly by root suckering and stump sprouting, forming groves of trees connected by a common fibrous root system (Weiseler 1998). Black locust spreads rapidly in riparian areas as well as upland sites, shading out lower-growing native vegetation. Trees within a single grove are likely to be genetically identical. Physical damage to roots and stems encourages suckering and sprouting. Abundant seeds are produced, but these seldom germinate unless scarified or are otherwise specially treated. Soaking in water is one method by which the impermeable seed coat can be treated to facilitate germination (Converse 1985). Once established, black locust groves persist for many years. Black locust is a nitrogen-fixer and its presence increases local soil nitrogen levels, a factor that often promotes the growth of other non-native plant species. Black locust is intolerant of competition with other trees (Converse 1985).

Control

- Prevention: To prevent black locust from spreading into new areas, wildlands should be monitored several times a year and remain relatively unaffected by new human development to the extent possible (Stone 2009).
- Mechanical: Black locust trees can usually be controlled through persistent mechanical treatment. Cutting or ringing the trees close to the ground will likely stimulate root sprouting, so repeatedly removing any new shoots at least two a year over a multi-period year may eventually kill the trees (DiTomaso and Healy 2007). Root sprouting can be reduced by digging out small trees and their main roots.
- Fire Management: Prescribed burns are not recommended, as they may stimulate root sprouting and even seed germination, resulting in the proliferation of the plants. Fire may also create conditions that favor establishment, such as the removal of competition or the deposition of nutrients into the soil.
- Biocontrol: Cattle and domestic goats have been effectively used to kill black locust over a period of years through repeated defoliation (Stone 2009).
- Herbicide: Newly-cut stumps should be immediately treated with a systemic herbicide for the most effective results, although drill-and-fill and hack-and-squirt methods can also be effective deterrents (DiTomaso and Healy 2007). Glyphosate has been shown to be an effective herbicide against black locust (Stone 2009).

Russian Thistle (*Salsola tragus*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: C
Observed within Survey Area: Yes, observed on Alternatives 1, 2, and the new 230 kV conductor corridor.

Ecology

Russian thistle is a large, bushy summer annual in the Goosefoot Family (*Chenopodiaceae*). It can be found throughout California, including agricultural areas, deserts, roadsides and other disturbed areas to 8,800 feet in elevation. Russian thistle can impede traffic and create fire hazards, and is a host of the beet leaf-hopper, an agricultural insect pest (Cal-IPC 2008). It reproduces by seed, which disperses when the plant turns into a "tumbleweed" and tumbles with the wind (DiTomaso and Healy 2007).

Control

- Mechanical: Young plants should be pulled or hoed before they can set seed, while older plants should be hoed just below ground level before setting seed (ESNERR 2000). Seedlings can be cut just above the cotyledons to prevent seed production and control infestations, but this must be continued until the seedbank is depleted, typically within two years for Russian thistle (DiTomaso and Healy 2007). Repeated mowing can also be an effective control method.
- Cultural: Soil solarization and mulching are recommended control methods.
- Biocontrol: Initial tests of insects to control the spread of Russian thistle have begun, but results are as yet inconclusive (Howard 1992). Livestock will generally eat Russian thistle from early spring until flowering, and again during winter when rainfall softens the sharp spines that have formed.
- Herbicide: For pre-emergence treatments, use an herbicide containing trifluralin. For post-emergence, non-selective herbicidal soap works best on young plants, while herbicides with dicamba are useful for mature plants. Other herbicides that are effective on Russian thistle are those containing glufosinate-ammonium, 2,4-D, dicamba, picloram, or glyphosate (ESNERR 2000).

Mediterranean Grass (*Schismus barbatus*)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: Unrated
Observed within Survey Area: Yes, observed on Alternative 3.

Ecology

Mediterranean grass is a low, tufted annual grass (*Poaceae*) found in central and Southern California, particularly in disturbed areas and deserts. They contribute to the conversion of desert shrubland into annual grassland by carrying fire across open areas, where they ignite and kill native shrubs (Cal-IPC 2008). The plant reproduces by seed and grows in the southwestern region, including deserts up to 3,940 feet in elevation. It prefers open, disturbed and undisturbed areas, roadsides, desert and semi-desert shrubland, dry river beds, mud flats, and waste places (DiTomaso and Healy 2007).

Control

- Mechanical: Soil disturbance contributes to the proliferation of *Schismus* species, and should be avoided to the extent possible during plant removal. Hand removal is possible, but difficult due to the small size of the plants. Plowing, disking, or scraping may aid in the reduction of surface biomass, but may eventually contribute to further growth if extensive disturbance occurs (Brooks 2000).
- Fire Management: Prescribed burns are generally counterproductive to controlling Mediterranean grass. Seeds are usually either near or beneath the ground level, and are unaffected by above-ground temperatures unless there is intense burning, such as under perennial shrubs. Due to the lack of post-fire competition and, in some cases, increase in soil nutrients, Mediterranean grass can dominate a community until other plants become reestablished.
- Biocontrol: There are no approved insects or fungi for controlling Mediterranean grass, although ants will harvest seeds from the inflorescence. While a black smut, *Ustilago aegyptica*, has been found to destroy the spikelets of Mediterranean grass, it does not appear to be naturally widespread enough to cause noticeable changes in the distribution of the species. Artificial application may provide acceptable control results. Moderate and intense grazing can cause increases in the amount of Mediterranean grass, as it causes soil disturbance and eliminates shrub cover.
- Herbicide: Various herbicides, such as glyphosate, are effective in controlling Mediterranean grass. However, due to the plant's small surface area, the use of herbicides brings the risk of affecting non-target species.

Sowthistle (*Sonchus* spp.)

Status

Cal-IPC Inventory Rating: Limited
CDFA Pest Rating: A (*Sonchus arvensis*), unrated (*S. asper*, *S. oleraceus*)
Observed within Survey Area: No, not observed during the surveys, but is known to be within the Project's vicinity and is considered likely to invade or colonize areas disturbed by construction or other ground-disturbing activities.

Ecology

There are three species of sowthistle listed in *Weeds of California and Other Western States*: two annuals, spiny sowthistle (*Sonchus asper*), which was observed during invasive species surveys, and annual sowthistle (*Sonchus oleraceus*); and one perennial, perennial sowthistle (*Sonchus arvensis*). These species are members of the Sunflower Family (*Asteraceae*). Both annual species are winter or summer annuals, with flowers that develop in the spring or summer (DiTomaso and Healy 2007). Their habitats include roadsides, fields, pastures, riparian areas, ditches, logged areas in forests, and other disturbed sites. Spiny sowthistle is common throughout California up to 6,194 feet in elevation and annual sowthistle is abundant throughout California (DiTomaso and Healy 2007). They reproduce by seed, which are reported to survive up to eight years. Perennial sowthistle is a noxious perennial, which has been eradicated from the Sacramento Valley, northern South Coast Ranges, and South Coast (DiTomaso and Healy 2007). Seeds germinate in the spring and disperse seeds 10 days after the flowers open (DiTomaso and Healy 2007). Under favorable conditions, perennial sowthistle can develop new plants from root fragments one centimeter long or more (DiTomaso and Healy 2007).

Control

- Prevention: Perennial sowthistle is most easily prevented by monitoring and detecting areas and eradicating young populations before they have a chance to mature and establish (McWilliams 2004).
- Mechanical: Young sowthistles should be removed while they are young, before they can flower and set seed (ESNERR 2000). Larger plants should be removed along with the taproot, if possible, because new shoots may grow from it. Seeds may still mature even after plants have been pulled. There is evidence to suggest that defoliation, or the continual removal of new leaf growth, may be an efficient method of controlling perennial sowthistle (McWilliams 2004).
- Cultural: Soil solarization and mulching are recommended for treatment and control of sowthistle (ESNERR 2000). It has been reported that an alfalfa or alfalfa-grass mixture that is regularly cut for hay can eliminate up to 90% of perennial sowthistle within a three-year period (McWilliams 2004).
- Biocontrol: There are currently no efficient biological controls that are available to use against sowthistle. There are several types of flies that have been used experimentally in Canada to control against perennial sowthistle, but it is so far unknown if these will be effective deterrents. Sheep, cattle, and rabbits have been known to feed on surface perennial sowthistle biomass, and occasionally on roots as well.
- Herbicide: Herbicides containing isoxaben are recommended for pre-emergence treatment, while herbicidal soaps are recommended for young plants and herbicides with glyphosate are recommended for large plants (ESNERR 2000). Perennial sowthistle as a seedling is moderately susceptible to auxins like 2,4-D, 2,4-DB, and MCPA, while established populations are moderately resistant (McWilliams 2004).

3.0 RISK ASSESSMENT

Different Alternatives of BRRTP would require different types of construction. All routing Alternatives (Alternatives 1, 2, 2a and 3) would require new 230 kV towers to be built. The construction of entirely new towers would cause sufficient ground disturbance to create conditions favorable to the spread and/or establishment of noxious weeds, many of which were identified within the existing rights-of-way. The new 230 kV conductor and the reconductoring components of the Project would not require the construction of new towers. The new 230 kV conductor would involve the placement of a new 230 kV circuit on existing towers. However, with or without new transmission tower construction, construction equipment and vehicles would be accessing tower locations along existing access roads and, as necessary, newly created or reopened spur roads. Most of the access roads are dirt roads with vegetation growing on either side, which would increase the risk of noxious weed seeds and propagules being transported by equipment and personnel, even with appropriate mitigation measures.

A risk assessment for the spread and establishment of noxious weeds was made for construction sites occurring along or adjacent to the main access routes for each portion of the Project (POWER 2010). This risk was based upon soil disturbing activities, existing road conditions, and current weed presence as determined during noxious weed surveys that occurred during 2008, 2009, and 2010. The three different risk ratings (Soil Disturbance Level, Weed Species Abundance, and Overall Threat) are presented below both in table format and in a discussion for each access road of each Alternative. The access roads listed are tentative and, while it is assumed that they will provide the best access for Project construction, final construction design may require different or additional roads to be used within the ANF. Because the ANF requested that only specific "high risk" noxious weed species be mapped during surveys, most species were determined only to be present or absent along the survey corridor, and the specific location detail for noxious weeds were not recorded. For example, the three noxious weeds that were mapped in specific locations along Alternatives 2 and 2a were tocalote, artichoke thistle, and saltcedar, but this does not exclude the presence of other high risk species.

3.1 ALTERNATIVE 1

TABLE 8. POTENTIAL ACCESS ROADS IDENTIFIED FOR CONSTRUCTION OF ALTERNATIVE 1 AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Forest Road 8N01	High	Medium	High
Forest Road 8N04	High	High	Medium

Forest Road 8N01

Soil Disturbance Level: High. This road would be used to access and construct new tower sites, entailing potential road grading and vegetation clearing. This has a high likelihood of creating favorable conditions for the spread of noxious weed species.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from low to medium.

Overall Threat: High. The moderate to low presence of noxious weeds along this road increases the potential for new populations of noxious weeds to invade. The disturbance of soil would greatly increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 8N04

Soil Disturbance Level: High. This road would be used to access and construct new tower sites, entailing potential road grading and vegetation clearing. This has a high likelihood of creating favorable conditions for the spread of noxious weed species.

Weed Species Abundance: High. The presence of weeds present along this road varies from abundant to medium.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

3.2 ALTERNATIVE 2

TABLE 9. POTENTIAL ACCESS ROADS IDENTIFIED FOR CONSTRUCTION OF ALTERNATIVE 2 AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Forest Road 6N21 (City Highline Road)	Medium	High	Medium
Forest Road 6N04 (Leona Divide Fire Road)	High	Low	Medium
Forest Road 7N01	High	Medium	Medium
Bee Canyon Access Road	High	High	Medium

Forest Road 6N21 (City Highline Road)

Soil Disturbance Level: Medium. This road would be used to access and construct new tower sites, entailing some road grading and vegetation clearing; however, this road is already wide enough in most places to allow large construction equipment to pass. This has a high likelihood of creating favorable conditions for the spread of noxious weed species such as slender wild oat, shortpod mustard, and the various *Bromus* species which are present throughout the area.

Weed Species Abundance: High. The most abundantly mapped vegetation community alongside this road was ruderal, followed by chamise chaparral. The presence of weeds present along this road varies from abundant on the southern half to low on the northern portion.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 6N04 (Leona Divide Fire Road)

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers and to clear and grade new spur roads and tower sites in dense chaparral for new transmission towers. This road may also require widening to allow equipment to pass on it, which would create further disturbance along the roadside. These activities would create conditions that are favorable for the spread of noxious weeds into new areas.

Weed Species Abundance: Low. The presence of weeds present along this road varies from low to medium.

Overall Threat: Medium. The low presence of noxious weeds increases the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 7N01

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers and to clear and grade new spur roads and tower sites in dense chaparral for new transmission towers. This road may also require widening and grading to allow equipment to pass on it, which would create further disturbance in and along the roadside. These activities would create conditions that are favorable for the spread of noxious weeds into new areas.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from abundant to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Bee Canyon Access Road

Soil Disturbance Level: High. This road would be used for access to and from the ROW, entailing potential road grading and potential vegetation clearing due to the general narrowness of the road. This has a high likelihood of creating favorable conditions for the spread of noxious weed species which are present throughout the area.

Weed Species Abundance: High. The presence of weeds present along this road varies from medium to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

3.3 ALTERNATIVE 2A

TABLE 10. POTENTIAL ACCESS ROADS IDENTIFIED FOR CONSTRUCTION OF ALTERNATIVE 2A AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Forest Road 6N21 (City Highline Road)	Medium	High	Medium
Forest Road 7N01	High	Medium	Medium
Forest Road 6N04 (Leona Divide Fire Road)	High	Low	Medium
Bee Canyon Access Road	High	High	Medium

Forest Road 6N21 (City Highline Road)

Soil Disturbance Level: Medium. This road would be used to access and construct new tower sites, entailing potential road grading and vegetation clearing; however, this road is already wide enough in most places to allow large construction equipment to pass. This has a high likelihood of creating favorable conditions for the spread of noxious weed species such as slender wild oat, shortpod mustard, and the various *Bromus* species which are present throughout the area.

Weed Species Abundance: High. The most abundantly mapped vegetation community alongside this road was ruderal, followed by chamise chaparral. The abundance of weeds present along this road varies from abundant to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 7N01

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers and to clear and grade new spur roads and tower sites in dense chaparral for new transmission towers. This road may also require widening and grading to allow equipment to pass on it, which would create further disturbance in and along the roadside. These activities would create conditions that are favorable for the spread of noxious weeds into new areas.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from abundant to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 6N04 (Leona Divide Fire Road)

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers and to clear and grade new spur roads and tower sites in dense chaparral for new transmission towers. These activities would create conditions that are favorable for the spread of noxious weeds into new areas. This road may also require widening to allow equipment to pass on it, which would create further disturbance along the roadside.

Weed Species Abundance: Low. The presence of weeds present along this road varies from medium to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Bee Canyon Access Road

Soil Disturbance Level: High. This road would be used for access to and from the ROW, entailing potential road grading and potential vegetation clearing due to the general narrowness of the road. This has a high likelihood of creating favorable conditions for the spread of noxious weed species which are present throughout the area.

Weed Species Abundance: High. The presence of weeds present along this road varies from medium to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

3.4 ALTERNATIVE 3

TABLE 11. POTENTIAL ACCESS ROADS IDENTIFIED FOR CONSTRUCTION OF ALTERNATIVE 3 AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Unnamed Access Road	High	High	Medium

Unnamed Access Road

Soil Disturbance Level: High. This road would be used to access and construct new tower sites, entailing potential road grading and vegetation clearing. This has a high likelihood of creating favorable conditions for the spread of noxious weed species.

Weed Species Abundance: High. The presence of weeds present along this road varies from abundant to medium.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

3.5 RECONDUCTORING

TABLE 12. POTENTIAL ACCESS ROADS IDENTIFIED FOR RECONDUCTORING AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Forest Road 6N21 (City Highline Road)	Low	High	Low
Forest Road 7N01	High	Medium	Low
Forest Road 6N04 (Leona Divide Fire Road)	High	Medium	Low
Bee Canyon Access Road	High	High	Medium

Forest Road 6N21 (City Highline Road)

Soil Disturbance Level: Low. This road would be used to access existing tower sites. This has a low likelihood of creating favorable conditions.

Weed Species Abundance: High. The most abundantly mapped vegetation community alongside this road was ruderal, followed by chamise chaparral. The abundance of weeds present along this road varies from abundant to low.

Overall Threat: Low. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil is expected to be nominal, but would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 7N01

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers. This road may also require widening and grading to allow equipment to pass on it, which would create further disturbance in and along the roadside. These activities would create conditions that are favorable for the spread of noxious weeds into new areas.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from abundant to low.

Overall Threat: Low. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. Disturbance of soil is expected to be nominal, but would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Forest Road 6N04 (Leona Divide Fire Road)

Soil Disturbance Level: High. Vehicles and equipment would drive on this unpaved access road to reconductor existing towers. This road may also require widening to allow equipment to pass on it, which would create further disturbance along the roadside. These activities would create conditions that are favorable for the spread of noxious weeds into new areas.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from abundant to medium.

Overall Threat: Low. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil is expected to be nominal, but would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Bee Canyon Access Road

Soil Disturbance Level: High. This road would be used for access to and from the ROW, entailing potential road grading and potential vegetation clearing due to the general narrowness of the road. This has a high likelihood of creating favorable conditions for the spread of noxious weed species which are present throughout the area.

Weed Species Abundance: High. The presence of weeds present along this road varies from medium to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

3.5.1 New 230 kV Conductor

TABLE 13. POTENTIAL ACCESS ROADS IDENTIFIED FOR INSTALLATION OF THE NEW 230 KV CIRCUIT AND WEED RISK

Access Road	Soil Disturbance Level	Weed Species Abundance	Overall Noxious Weed Threat
Grasshopper Fire Road	High	High	Medium
Lake Hughes Road	Low	Medium	Low

Grasshopper Fire Road

Soil Disturbance Level: High. This existing unpaved road would be used to access tower sites, entailing potential road grading and vegetation clearing. This has a low likelihood of creating favorable conditions for the spread of noxious weed species due the existing use of this road for current operation and maintenance of the line.

Weed Species Abundance: High. The presence of weeds present along this road varies from abundant to low.

Overall Threat: Medium. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

Lake Hughes Road

Soil Disturbance Level: Low. This road would be used to access spur roads to tower sites, entailing potential road grading and vegetation clearing. As this is a well-traveled paved road, it is unlikely that conditions favorable for the spread of noxious weed species would occur while it is in use for this Project.

Weed Species Abundance: Medium. The presence of weeds present along this road varies from abundant to medium.

Overall Threat: Low. The presence of abundant noxious weeds reduces the potential for new populations of noxious weeds to invade. The disturbance of soil is unlikely, but any disturbance created would increase opportunities for existing weeds to continue invading the area. Implementation of BMPs and mitigation measures, as mentioned in Section 1.2, would reduce the overall threat of noxious weeds along this road.

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5.0 LIST OF ACRONYMS

AC	Alternating Current
ACSS/AW	Aluminum Conductor Steel Supported/Aluminum-clad Steel Wire
ACSS/TW/HS	Aluminum Conductor Steel Supported/Trapezoidal Wires/High Strength
ANF	Angeles National Forest
BLM	Bureau of Land Management
BMP	Best Management Practice
BR-RIN	Barren Ridge - Rinaldi
BRRTP	Barren Ridge Renewable Transmission Project
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FR	Federal Registry
Forest Service	U.S. Department of Agriculture, Forest Service
GAP	Gap Analysis Program
GIS	Geographic Information System
kcmil	1,000 circular mills (unit of area)
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
LMP	Land Management Plan
NDDB	Natural Diversity Database
NFS	National Forest System
NFMA	National Forest Management Act
OHV	Off Highway Vehicle
PDCI	Pacific Direct Current Intertie
PP2	Power Plant #2
RCA	Riparian Conservation Area
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
TRTP	Tehachapi Renewable Transmission Project
TSP	Tubular Steel Pole
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WEAP	Worker Environmental Awareness Program

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Vanessa Santistevan – Biologist
Ryan Winkleman – Biologist

APPENDIX L: VISUAL SIMULATIONS AND RIGHT-OF-WAY CROSS-SECTIONS

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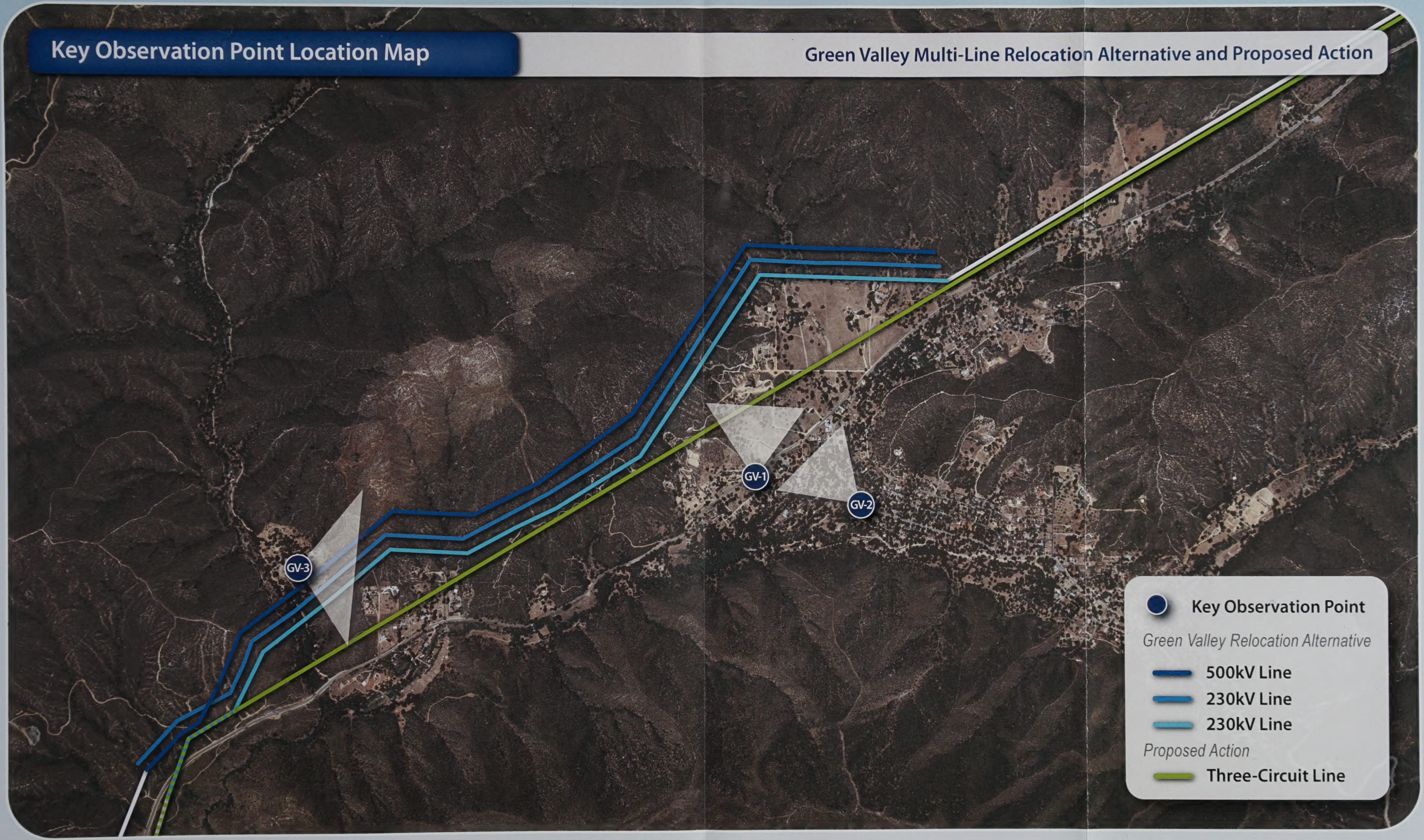
Key Observation Point Location Map

Green Valley Multi-Line Relocation Alternative and Proposed Action


GV-3
GV-1
GV-2
Key Observation Point
Green Valley Relocation Alternative
500kV Line
230kV Line
230kV Line
Proposed Action
Three-Circuit Line

LA DWP

POWER ENGINEERS

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

May 21, 2012

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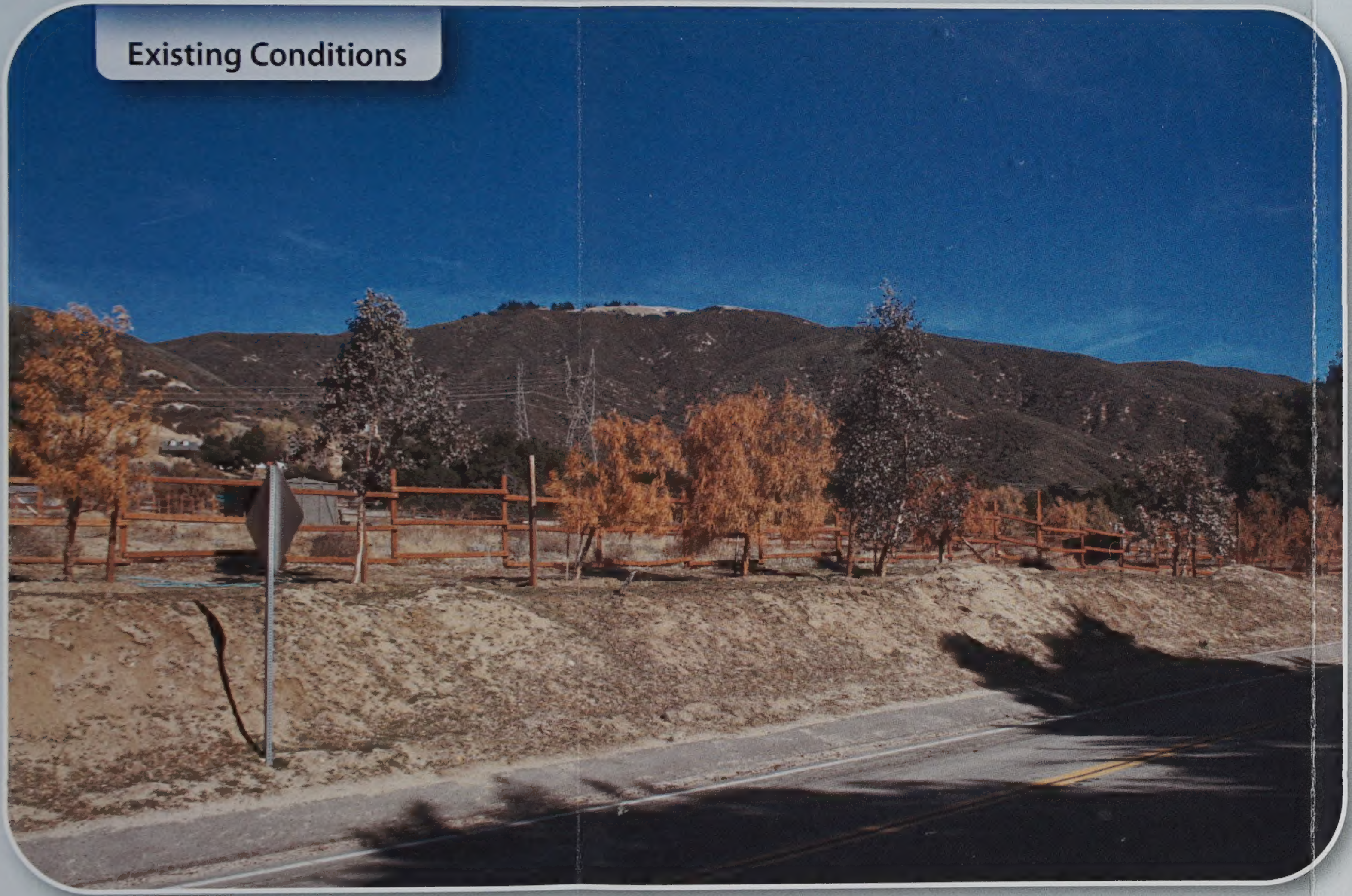
Green Valley Multi-Line Relocation Alternative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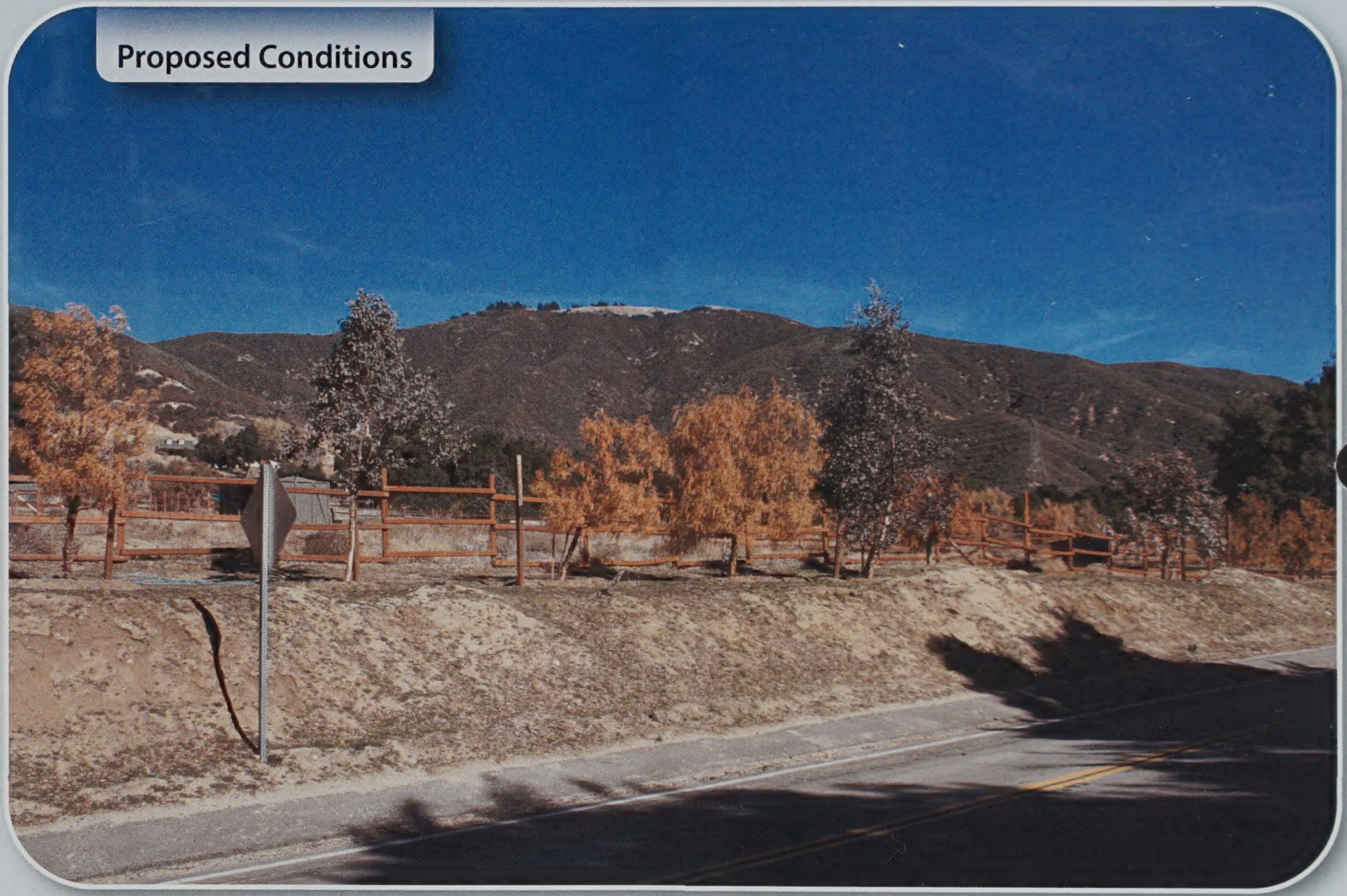
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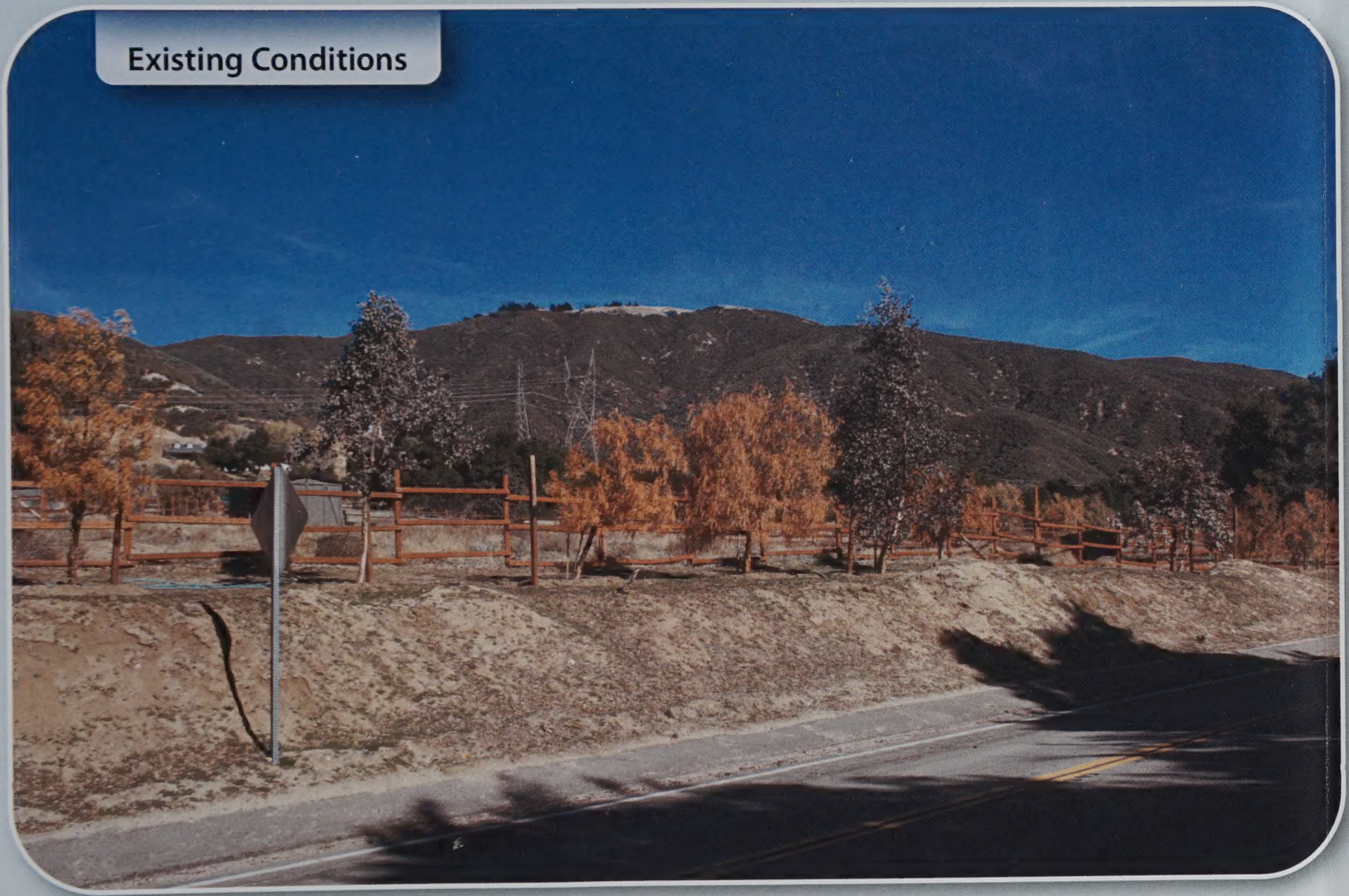
POWER ENGINEERS

May 21, 2012

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

GV-1

Proposed Action



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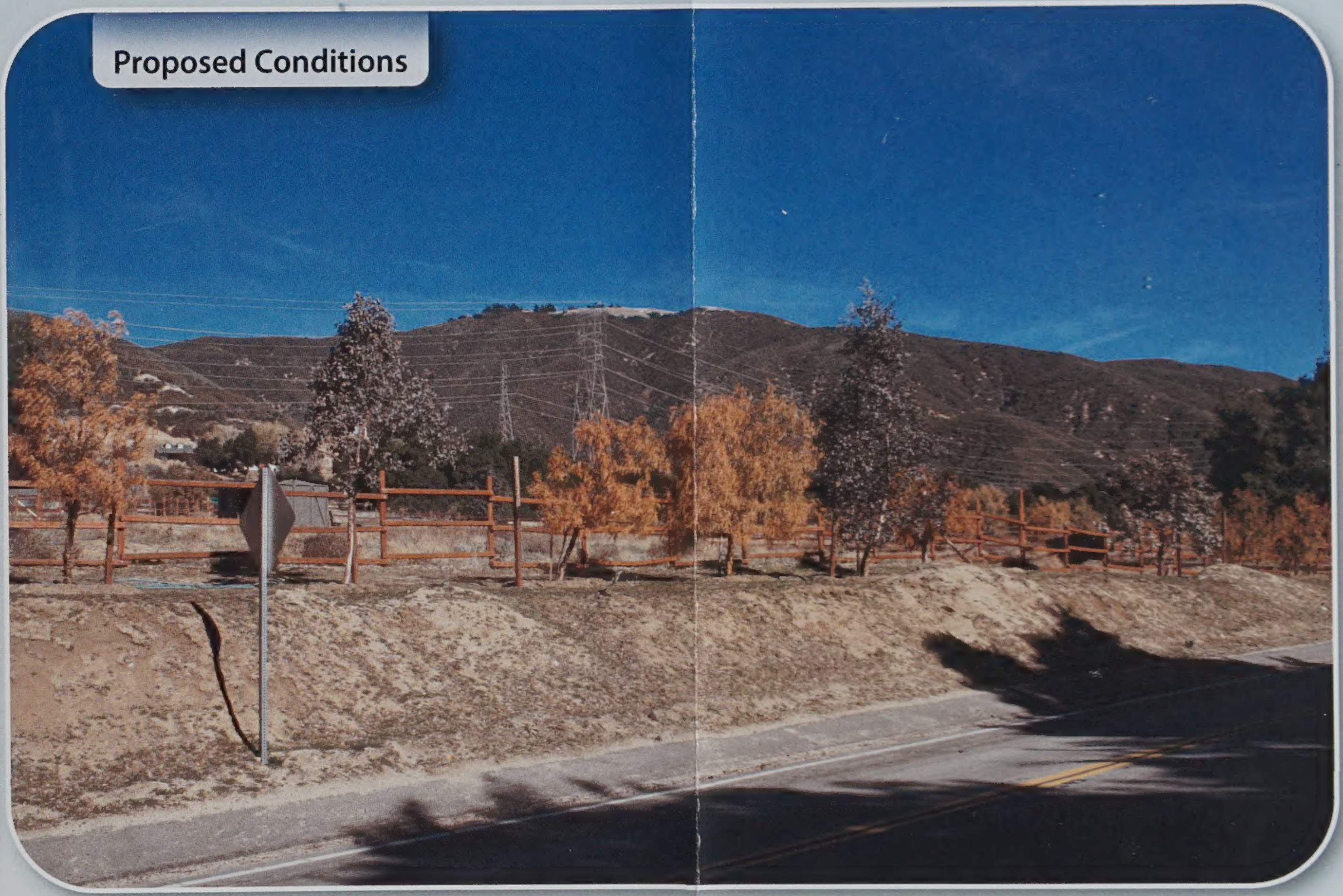

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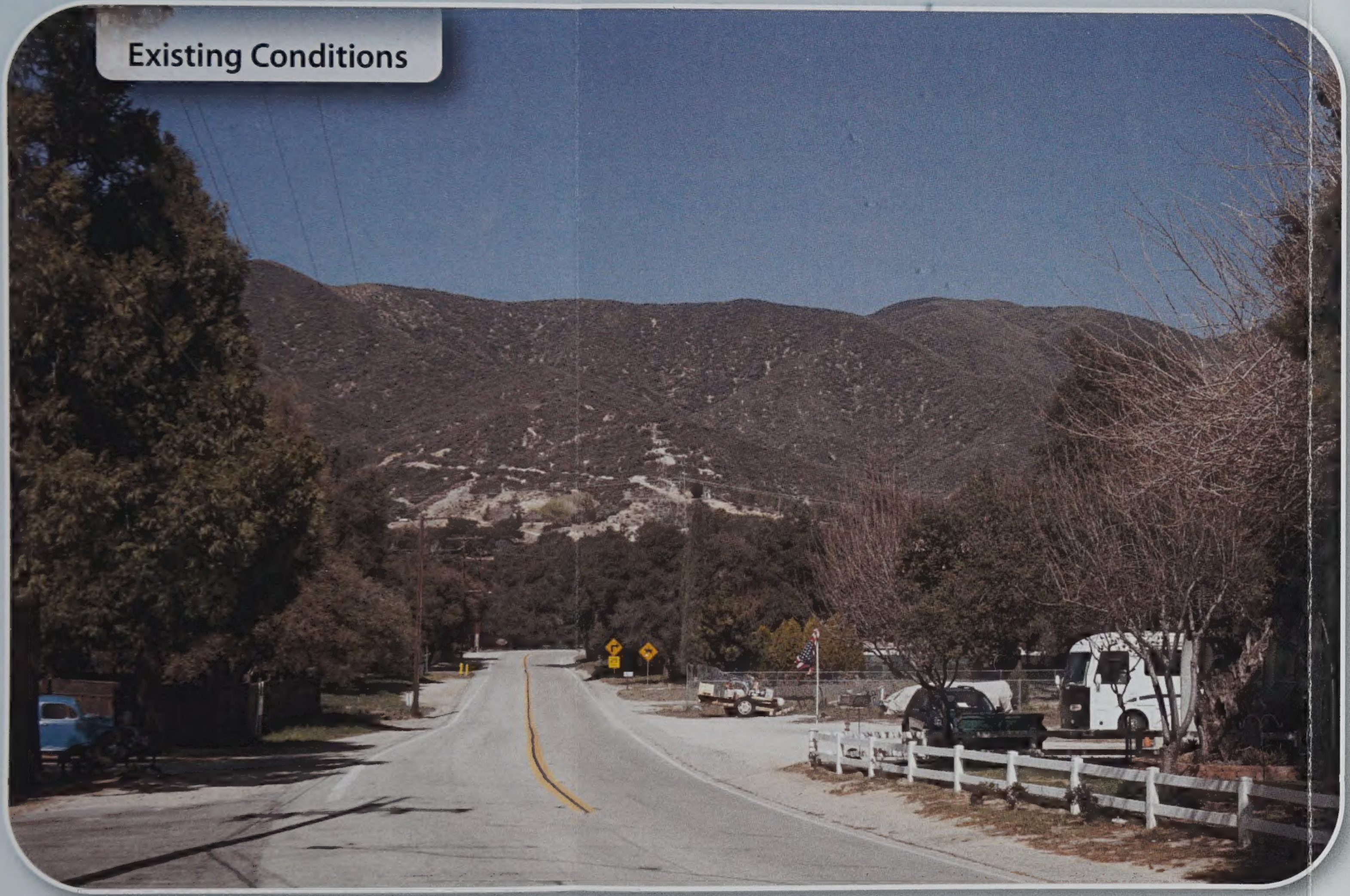
May 21, 2012

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

GV-2

Green Valley Multi-Line Relocation Alternative



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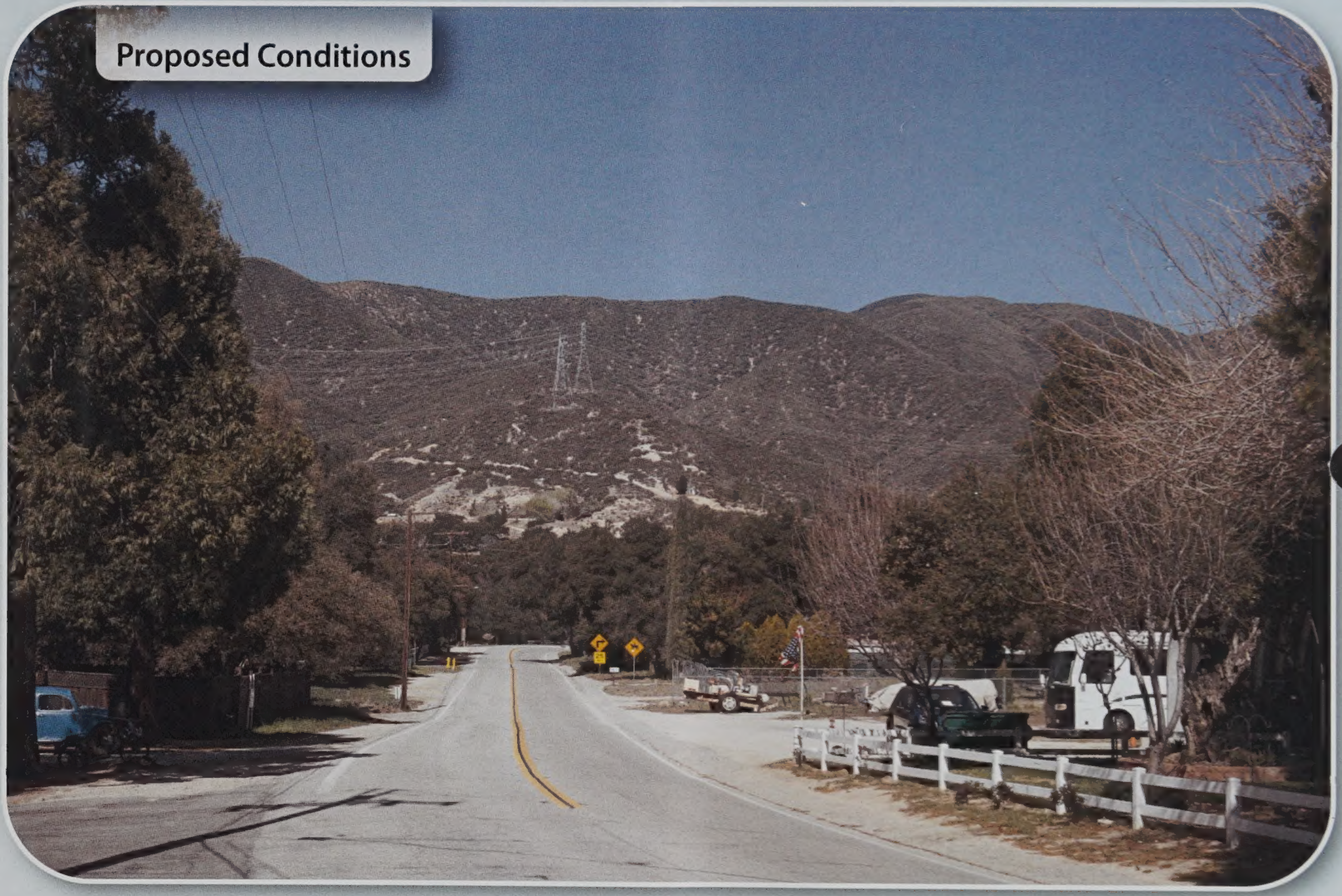

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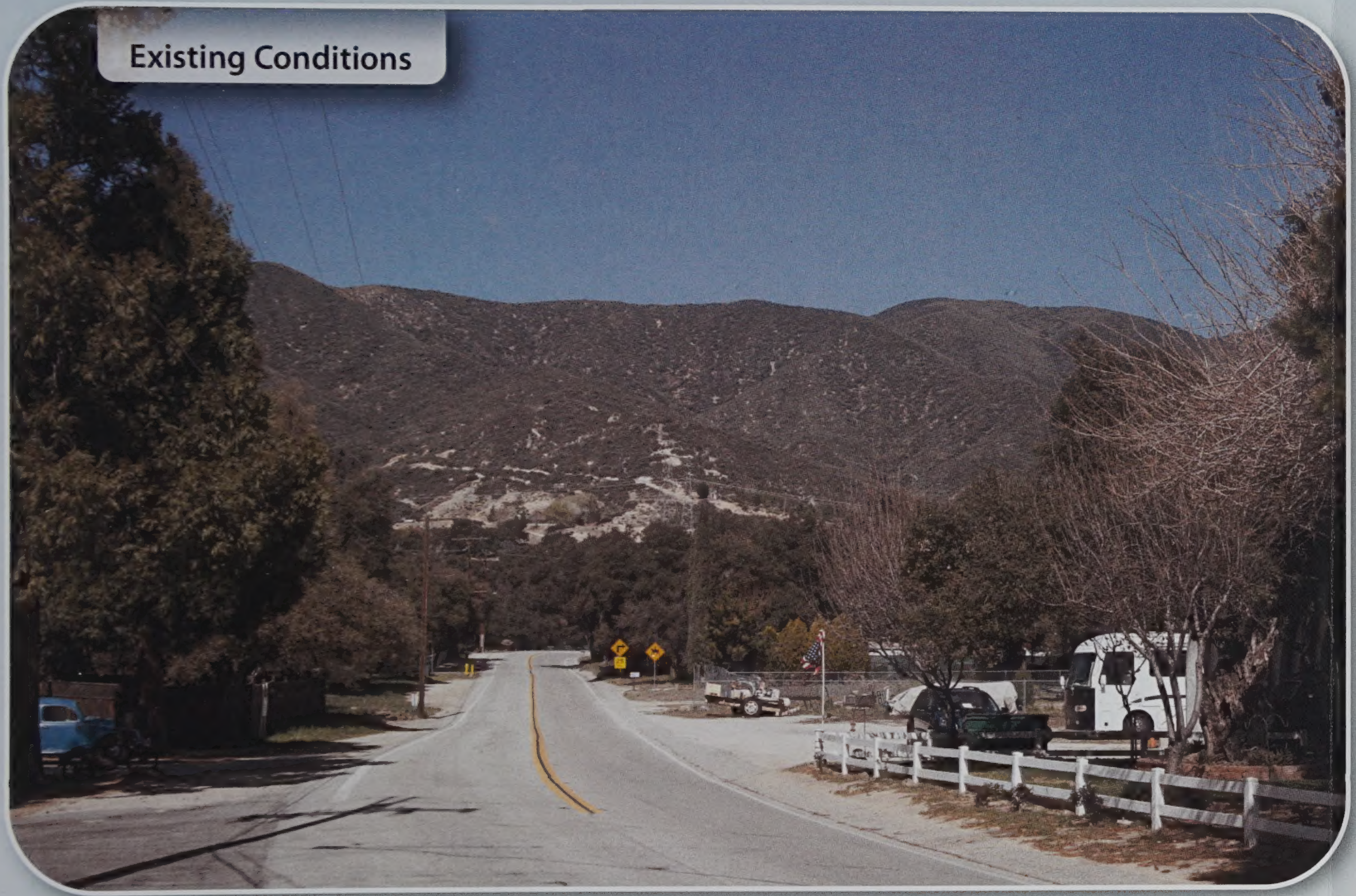
May 21, 2012

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

GV-2

Proposed Action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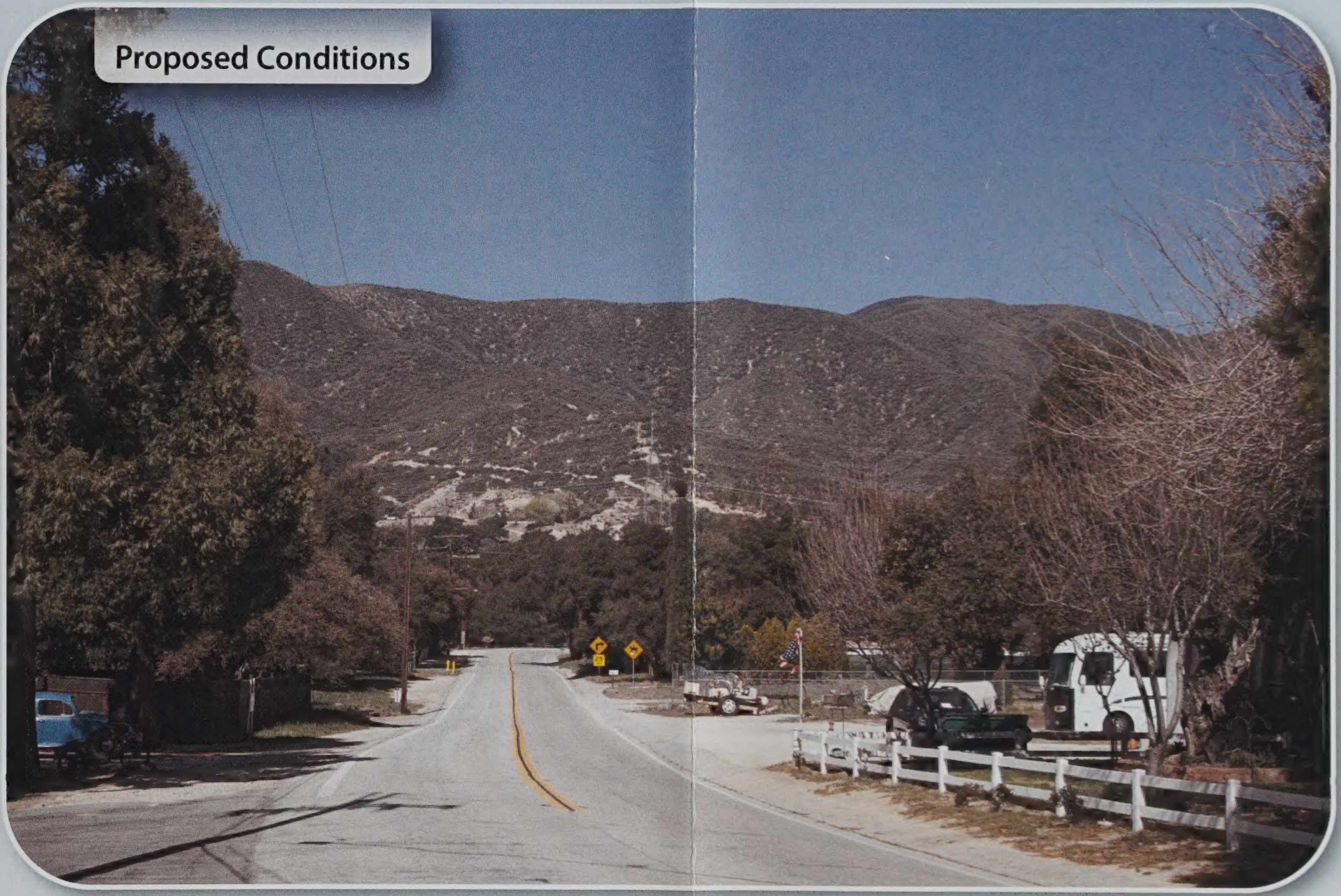
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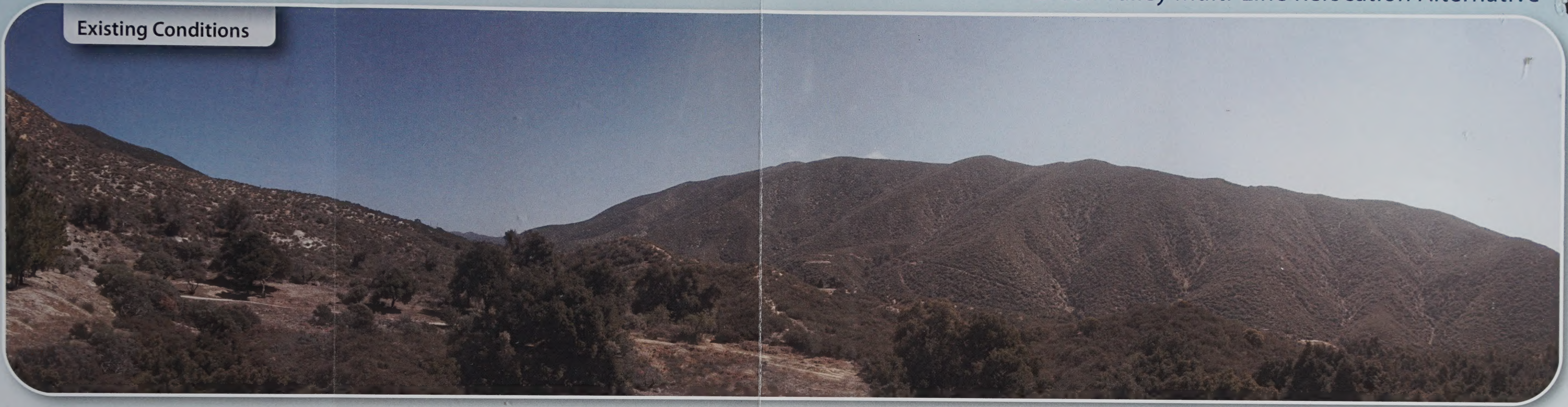
May 21, 2012

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

GV-3

Green Valley Multi-Line Relocation Alternative



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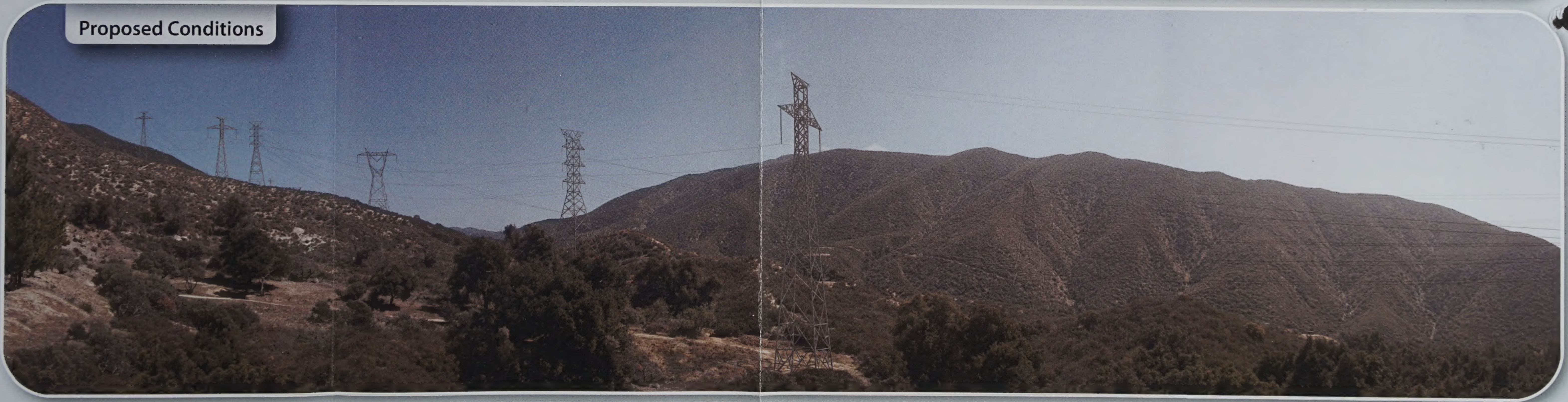

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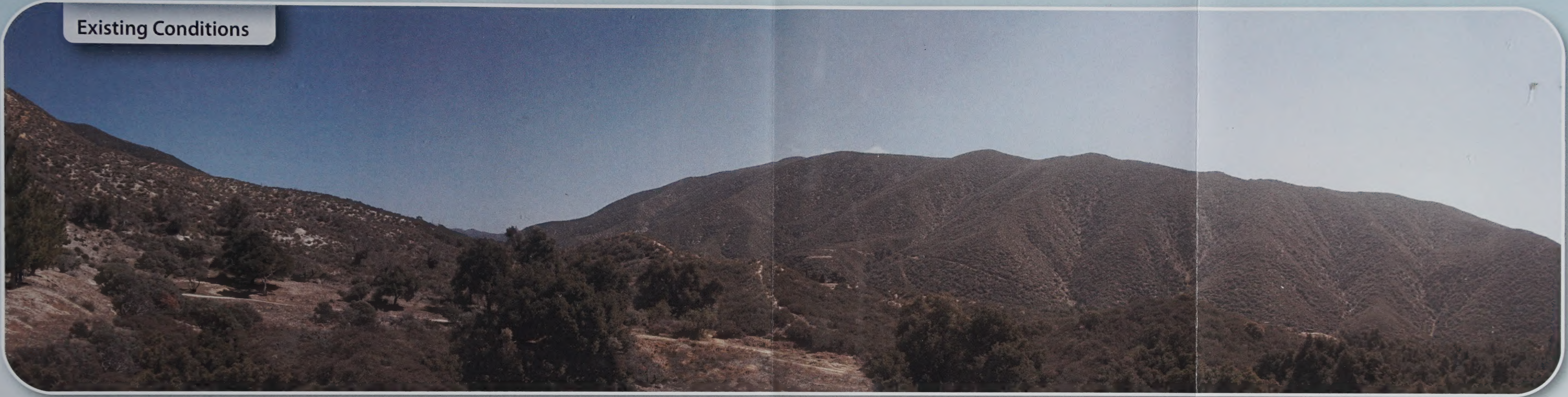
May 21, 2012

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

GV-3

Proposed Action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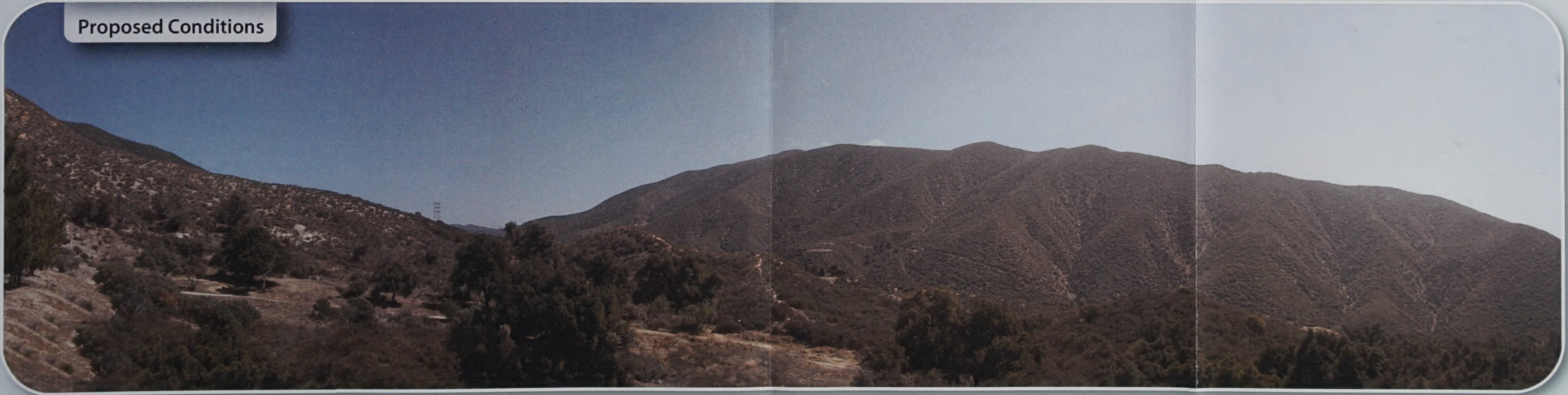
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POWER ENGINEERS

May 21, 2012

APPENDIX N: GENERAL CONFORMITY DETERMINATION

1.0 INTRODUCTION

The U.S. Department of Agriculture (USDA) Forest Service and the U.S. Department of the Interior (USDOI) Bureau of Land Management are in the process of evaluating environmental effects of the Barren Ridge Renewable Transmission Project (BRRTP). This Project would connect renewable resource areas in Kern County with Los Angeles Department of Water and Power's (LADWP) transmission system in order to deliver power produced by renewable resources to utility load centers. The Preferred Alternative selected by the USDA Forest Service and USDOI Bureau of Land Management, includes new transmission lines and upgraded infrastructure along an approximately 76 mile corridor beginning at the Barren Ridge Substation in Kern County and extending south through the Antelope Valley, the Angeles National forest (ANF), and continuing to the proposed Haskell Substation in Los Angeles County, California.

Based on the General Conformity requirements as codified in 40 CFR Part 93 et seq; November 1993, the USDA Forest Service and the USDOI Bureau of Land Management must make a determination of whether the Proposed Action conforms to the applicable State Implementation Plan (SIP). Conformity is defined as compliance with the SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards, and that the activities will not:

- Cause or contribute to any new violation of any standard;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

2.0 PROJECT DESCRIPTION AND SCHEDULE

The BRRTP is located in Kern and Los Angeles counties. It is approximately 76 miles in length and extends from the Barren Ridge Switching Station to Rinaldi Substation, and extends approximately 12 miles from Castaic Power Plant to the proposed Haskell Switching Station. The proposed BRRTP includes the following elements:

1) Construction of a new double-circuit 230 kV transmission line from the Barren Ridge Switching Station to a new switching station located within Haskell Canyon. For approximately two miles, from Bee Canyon to Haskell Canyon, the new transmission lines will be placed onto vacant positions on the existing four-circuit structures (towers numbered 234-3 through 236-1).
2) Addition of approximately 12 miles of 230 kV transmission circuit onto existing structures (towers 1-1 through 12-1) between the new Haskell Canyon Switching Station and the Castaic Power Plant. Approximately four miles of NFS lands and 300 feet of BLM-managed public lands would be traversed.
3) Reconductor approximately 75 miles of the existing BR-RIN 230 kV transmission line with larger conductors from the Barren Ridge Switching Station and Rinaldi Substation (towers 176-1 through 251-1). Approximately 13 miles of NFS lands and four miles of BLM-managed public lands would be traversed.

4) Construction of a new 400 feet by 600 feet switching station in Haskell Canyon.
5) Expansion of the existing Barren Ridge Switching Station located 12 miles north of Mojave, California. The existing switching station is approximately 250 feet by 500 feet. It would be expanded by 235 feet for a total station size of 485 feet by 500 feet (5.5 acres).

The BRRTP falls within portions of two different air basins. These are the Mojave Desert Air Basin (MDAB) and the South Coast Air Basin (SCAB). The BRRTP Area falls within the jurisdiction of three different regional air districts. The Antelope Valley Portion of Los Angeles County is in the Antelope Valley Air Quality Management District (AVAQMD). The non-desert portion of Los Angeles County is within the SCAQMD. The eastern (desert) portion of Kern County is within the Kern County Air Pollution Control District (KCAPCD).

3.0 GENERAL CONFORMITY REQUIREMENTS

Section 176(c) of the Federal Clean Air Act (CAA), as articulated in the USEPA General Conformity Rule (40 CFR 93 et seq.), states that a federal agency cannot issue a permit for or support an activity unless the agency determines that it will conform to the most recent USEPA-approved SIP. This means that projects using federal funds or requiring federal approval must not (1) cause or contribute to any new violation of a NAAQS, (2) increase the frequency or severity of any existing violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone. Under the CAA, a conformity analysis must be prepared only for nonattainment criteria pollutants, or their precursors, in nonattainment or maintenance areas (40 CFR §93.153(b)). Moreover, according to 40 CFR §93.153(b), if the total direct and indirect emissions from the Federal action equal or exceed the General Conformity Rule "*de minimis*" emission thresholds, then the Federal action is required to prepare a general conformity determination.

Table 1 provides the current nonattainment/maintenance area designation and General Conformity *de minimis* emission thresholds for the SCAB, and the Antelope Valley and Kern County portions of the MDAB.

Table 1
***De Minimis* Levels for Determination of Applicability of General Conformity Rule**
(Tons/year)

Air Basin	CO	NO_x	ROG	PM_{10}	$PM_{2.5}$
MDAB	N/A	25	25	N/A	N/A
SCAB	100	10	10	70	100

Section 40 CFR 93.158 (a) state that if a project's emission levels exceed the *de minimis* thresholds and there is no applicable exemption, then a conformity determination must be prepared. The conformity determination requires that the Federal agency demonstrate, through computer modeling, purchasing offsets, or other avenues, that emissions associated with the Federal action are in compliance with the SIP.

In addition, the conformity determination criteria listed in 40 CFR 93.158 requires a public participation program. Requirements include a 30-day public comment period, notification in a daily newspaper in the area affected by the Federal Action, and response to public comments which are to be made available upon request within 30 days of the public notice of the final decision.

4.0 PROPOSED ACTION EMISSIONS

The Proposed Action emissions within the USDA Forest Service and USDOI Bureau of Land Management's control have been determined for the duration of the construction period and the 50-year operating period of the transmission line. The analysis has been conducted to satisfy the requirements of 40 CFR 93.159(d), which state:

(d) The analyses required under this subpart must be based on the total of direct and indirect emissions from the action and must reflect emission scenarios that are expected to occur under each of the following cases:

(1) The attainment year specified in the SIP, or if the SIP does not specify an attainment year, the latest attainment year possible under the Act; or

(2) The last year for which emissions are projected in the maintenance plan;

(3) The year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis; and

(4) Any year for which the applicable SIP specifies an emissions budget.

The maximum annual emissions occur during the construction period. The construction and operational emissions would cover a period out to approximately 2065, which is well past any mandated attainment year or any emissions projections in any maintenance plan, and past any year the SIP specifies an emissions budget.

Construction Emissions

Construction emissions include emissions from off-road and on-road equipment, emissions from helicopters used in the construction of the BRRTP, and emissions of fugitive dust. On-site air pollutant emissions during construction would principally consist of exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment, fugitive dust from earthmoving activities, and fugitive dust from travel of vehicles and equipment on unpaved surfaces. Off-site air pollutant emissions would result from workers commuting to and from the construction site, transport of construction materials to and from the site using trucks, and helicopters used in the construction.

Construction Schedule. The emission calculations used the latest LADWP construction schedule provided in July 2010. The analysis also used data on the number of transmission towers in the segments within the USDA Forest Service and USDOI Bureau of Land Management jurisdiction that will be reconductored as part of the project to calculate helicopter emissions. Reconductoring is the only activity that will require the use of helicopters. A linear construction schedule, where work would occur from north to south for each affected project segment, was assumed. Based on the current construction schedule, the following years of construction activities were assumed:

- 2012 – Preparation activities for construction of Haskell Switching Station and expansion of Barren Ridge Switching Station
- 2013 – Construction of new transmission line, Haskell Switching Station, and expansion of Barren Ridge Switching Station
- 2014 – Reconductoring of existing transmission line

The Haskell and Barren Ridge Switching Stations are outside of Federal lands and would not be considered in this conformity analysis.

The number of towers that will be reconductored within Federal lands, and associated emissions, were calculated based on the lengths of the transmission line to be reconductored. Table 2 presents a summary of the length of transmission lines within Federal lands, the number of towers that will be reconductored, and the air district under which jurisdiction the portion of the Proposed Action is located.

Table 2
Segment Lengths and Transmission Towers within Federal Lands

Air Basin	Jurisdiction	Miles of Transmission Line	Number of Towers
MDAB	Bureau of Land Management	3.67	18
SCAB	Forest Service	12.99	65

Off-road Equipment Emissions. The methodology for estimating on-site construction emissions associated with off-road equipment consists of two basic steps: (1) determining the total number of operating hours for each piece of equipment; and (2) applying the appropriate emission factor to compute the associated emissions for each piece of operating equipment. Equipment requirements and operating hours were obtained from the construction schedule provided by LADWP for the Proposed Action. Emission factors used for this project are based on information from the California Air Resources Board's (CARB) OFFROAD2007 Model, as calculated by the SCAQMD, which represents the fleet of construction emissions available within the region. The SCAQMD used the OFFROAD2007 Model to calculate the emissions for off-road equipment contained within their SIP emissions budget. Exhaust emissions were computed by multiplying the emission factors for each equipment type by the number of equipment pieces, the daily hours of operation, and the number of days the equipment is expected to be used. Exhaust emissions from off-road equipment were then summed to obtain total criteria pollutant emissions for this source category. Attachment A contains detailed emission calculations and includes assumptions used in the analysis.

On-Road Vehicle Emissions. On-road vehicle emissions include emissions from worker vehicles and from truck trips associated with transport of materials to the construction site. The number of worker trips was estimated based on estimates of workforce requirements for the project. It was assumed, on average, that workers would travel 80 miles per day. Truck trips were estimated based on the number and types of trucks identified in the construction schedule. It was also assumed, on average, that trucks would travel 80 miles per day to the construction site. On-road mobile emissions were quantified using emission factors from the EMFAC2007 Model, which was used by the SCAQMD to calculate emissions for on-road vehicles contained within their SIP emissions budget. Emission factors are based on the year of construction. Attachment A contains detailed emission calculations and includes assumptions used in the analysis.

Fugitive Dust Emissions. Fugitive dust emissions include emissions from earthmoving activities and emissions from vehicles traveling on unpaved roads. Fugitive PM_{10} and $PM_{2.5}$ emissions factors were obtained based on mitigated emission factors from the references used by the SCAQMD, including *Improvement of Specific Emission Factors (BACM Project No. 1) Final Report* (MRI 1996), the URBEMIS Model, Version 9.2.4 (Rimpo and Associates 2007), and the USEPA AP-42 Section 13 (USEPA 2005) as appropriate for each type of fugitive dust emission source. Specific emission factor calculations and citations are provided in Attachment A. Fugitive dust emissions were assumed to be mitigated based on the use of watering and/or application of a durable non-toxic soil stabilizer.

Helicopter Emissions. Helicopter emissions were based on the types of helicopters and the number of helicopter trips as provided by LADWP. Three types of helicopters were assumed to be required: a light-lift helicopter, a medium-lift helicopter, and a heavy-lift. The light-lift helicopter was assumed to be used to transport personnel to the site and for conductor removal and installation. The medium-lift helicopter would be used for heavier activities such as pad construction, foundation excavation, and equipment removal as required. The heavy-lift helicopter would only be used for heavy activities such as transport and installation of tower components. Helicopter emissions were estimated based on assumed horsepower of the helicopter engines, with emission factors from the Federal Aviation database (FAA 2001). Soil stabilizers will be required on unpaved/disturbed helicopter staging areas, such that fugitive dust prop wash is considered negligible.

Mitigation Measures

To demonstrate conformity with the SIP, feasible control measures that have been identified as SIP measures must be implemented by the project. In addition, mitigation measures were identified in the Draft EIR/EIS for the Proposed Action. The mitigation measures, which will be enforced by the appropriate regulatory agencies or by the USDA Forest Service in lands under their jurisdiction and by the USDOI Bureau of Land Management in lands under their jurisdiction[1] after completion of the FEIS and approval of the Record of Decision (ROD), are as follows:

Mitigation Measure AIR-2a: Implement Construction Fugitive Dust Control Plan. The construction contractor shall develop a Fugitive Dust Emission Control Plan (FDECP) for construction work. Measures to be incorporated into the plan include, but are not limited to, the following where practical:

- Water the disturbed areas of the active construction sites in sufficient quantities to prevent the generation of visible dust plumes. Watering may not be required in wet weather. Soil binders may be used in lieu of watering where soil binders are appropriate and prevent the generation of visible dust plumes.

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[1] Mitigation measures in non-federal lands will be enforced by LADWP as the lead agency under CEQA.

- Enclose, cover, or water twice daily to exposed piles with a five percent or greater silt content.
- CARB certified and agency approved (on federal lands) non-toxic soil binders shall be applied per manufacturer recommendations to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction (as allowed by responsible agencies such as the USDA Forest Service and USDOI Bureau of Land Management) to reduce fugitive dust emissions. Other watering products, selected from lists available from USEPA's Environmental Technology Verification program or the SCAQMD, may be applied per manufacturer recommendations in place of the CARB certified soil binders if such products can be reasonably demonstrated to be as effective as the CARB certified non-toxic soil binders and be approved by the affected federal agency.
- Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface, to reduce fugitive dust emissions.
- All vehicle tires shall be inspected, are to be free or dirt, and washed as necessary before entering paved roadways. In lieu of washing vehicle tires, the construction contractor may sweep roads on a regular basis or employ similar methods to reduce dust track-out.
- Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit unpaved areas.
- Cover all trucks hauling soil and other loose material, or require at least two feet of freeboard.
- Establish a vegetative ground cover (in compliance with biological resources impact mitigation measures) as appropriate or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites after active construction operations have ceased.
- Increase the frequency of watering unpaved surfaces under active construction to more than three times daily, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources as required by SCAQMD Rule 403 prior to wind events.
- Travel routes to each construction site shall be developed to minimize unpaved road travel.
- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- Prevent spillage when hauling loose material by limiting speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 miles per hour.

Mitigation Measure AIR-2b: Properly Maintain Mechanical Equipment. The construction contractor shall ensure that all mechanical equipment associated with project construction is properly tuned and maintained in accordance with the manufacturer's specifications to the extent feasible, and is maintained to perform at CARB and/or USEPA certification levels. The construction contractor shall prevent tampering with equipment. This measure will be verified through unscheduled inspections.

Mitigation Measure AIR-2c: Use Ultra Low-sulfur Diesel Fuel. CARB-certified ultra low-sulfur diesel (ULSD) fuel containing 15 ppm sulfur or less shall be used in all diesel-powered construction equipment to the extent feasible.

Mitigation Measure AIR-2d: In accordance with LADWP's Environmental Affairs Bulletin 2007-05 dated March 12, 2007, and in accordance with the requirements of the CARB's idling regulations, vehicles with a gross vehicle weight rating (GVWR) of greater than 10,000 pounds "shall not idle the vehicle's primary diesel engine for greater than five minutes at any location." This measure will be verified by LADWP through unscheduled inspections. The five-minute idling limit does not apply for the period during which:

- Idling must occur due to traffic conditions.
- Idling when the vehicle is queuing that at all times is more than 100 feet from any real property zoned for individual or multifamily housing units that has one or more such units on it.
- Idling when forced to remain motionless due to immediate adverse weather conditions.
- Idling to verify that the vehicle is in safe operating condition.
- Idling is required for mandatory resting, servicing, repairing, or diagnostic purposes.
- Idling when positioning or providing a power source for equipment or operations other than transporting passengers or propulsion.
- Idling while operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency.

Mitigation Measure AIR-2e: Schedule Deliveries Outside of Peak Traffic Hours. All material deliveries to the marshalling yards and from the marshalling yards to the construction sites shall be scheduled outside of peak traffic hours (6:00 to 9:30 am and 3:30 to 6:30 pm) to the extent feasible, and other truck trips during peak traffic hours shall be minimized to the extent feasible. Construction scheduling will be planned to minimize vehicle trips.

Mitigation Measure AIR-2f: Off-road Diesel-fueled Equipment Standards. During Project construction, all internal combustion engines/construction equipment operating on the Project site shall meet USEPA-Certified Tier 2 emissions standards, or higher according to the following:

- January 1, 2012 to December 31, 2014: all offroad diesel-powered construction equipment greater than 50 hp shall meet Tier 3 offroad emissions standards. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.
- Post-January 1, 2015: All offroad diesel-powered construction equipment greater than 50 hp shall meet the Tier 4 emission standards, where available. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.

- A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment.
- Encourage construction contractors to apply for AQMD "SOON" funds. Incentives will be provided for those construction contractors who apply for AQMD "SOON" funds. The "SOON" program provides funds to accelerate clean up of offroad diesel vehicles, such as heavy duty construction equipment.
- Alternative fuels such as natural gas and electricity shall be used where available and feasible.

This measure will be implemented through development of administrative controls, including:

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;
- Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and
- Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which the construction contractor will minimize impacts to these populations (e.g., locate construction equipment and staging zones away from sensitive receptors and building air intakes).
- Provide advanced notification to sensitive receptors of the potential effects of PM_{10} and $PM_{2.5}$, as well as toxic air contaminants, prior to construction.

Mitigation Measure AIR-2g: On-road Vehicles Standards. All on-road construction vehicles shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.

Mitigation Measure AIR-2h: Off-road Gasoline-fueled Equipment Standards. All off-road stationary and portable gasoline powered equipment shall have USEPA Phase 1/Phase 2 compliant engines, where the specific engine requirement shall be based on the new engine standard in affect two years prior to initiating project construction.

Mitigation Measure AIR-2a was taken into account in the emission estimates. For Mitigation Measure AIR-2a, a control efficiency of 61 percent was assumed for watering three times daily. Other fugitive dust-causing activities (such as earthmoving) were controlled by watering with emission reductions calculating by using a conservatively low assumed soil moisture content of 10 percent. Mitigation measures will be included in the ROD for the Proposed Action, as Federal Lead Agencies, the USDA Forest Service and USDOI Bureau of Land Management are required to enforce compliance with these measures in areas under their jurisdiction.

Emission Estimates

To date, three alternatives are under consideration for the Proposed Action. Anticipated mitigated annual emissions for each segment of the Proposed Action within Federal Lands were calculated based on the project alternative with the highest emissions. Emissions from any of the alternatives would not be anticipated to be higher than the emissions presented in Table 3. Emissions are compared with the applicable *de minimis* thresholds.

Table 3.
Alternative 1 Project Annual Construction Emissions and Comparison with General Conformity *De Minimis* Thresholds

Air Basin	Emissions					
	ROG	CO	NO_X	SO_X [a]	PM_{10}	$PM_{2.5}$
	2013 Annual Emissions, tpy					
	ROG	CO	NO_X	SO_X [a]	PM_{10}	$PM_{2.5}$
EKAPCD						
New Transmission Line Construction – Federal Lands	**0.25**	**2.73**	**1.32**	**0.00**	**2.79**	**0.43**
General Conformity De Minimis Threshold	100		100			
Exceeds Threshold?	**No**	**N/A**	**No**	**N/A**	**N/A**	**N/A**
AVAQMD						
New Transmission Line Construction – Federal Lands	**0**	**0**	**0**	**0**	**0**	**0**
General Conformity De Minimis Threshold	25		25			
Exceeds Threshold?	**No**	**N/A**	**No**	**N/A**	**N/A**	**N/A**
SCAQMD						
New Transmission Line Construction – Federal Lands	**5.84**	**31.41**	**26.70**	**0.19**	**14.92**	**3.21**
General Conformity De Minimis Threshold	10	100	10	100	70	100
Exceeds Threshold?	**No**	**No**	**Yes**[b]	**No**	**No**	**No**
Air Basin	Emissions					
	2014 Annual Emissions, tpy					
	ROG	CO	NO_X	SO_X [a]	PM_{10}	$PM_{2.5}$
EKAPCD						
Reconductoring – Federal Lands	**1.27**	**4.61**	**5.19**	**0.04**	**2.60**	**0.64**
General Conformity De Minimis Threshold	100		100			
Exceeds Threshold?	**No**	**N/A**	**No**	**N/A**	**N/A**	**N/A**
AVAQMD						
Reconductoring – Federal Lands	**0.87**	**3.38**	**3.92**	**0.03**	**1.65**	**0.44**
General Conformity De Minimis Threshold	25		25			
Exceeds Threshold?	**No**	**N/A**	**No**	**N/A**	**N/A**	**N/A**
SCAQMD						
Reconductoring – Federal Lands	**4.65**	**16.56**	**20.56**	**0.16**	**5.71**	**2.00**
General Conformity De Minimis Threshold	10	100	10	100	70	100
Exceeds Threshold?	**No**	**No**	**Yes**[b]	**No**	**No**	**No**

[a] As $PM_{2.5}$ Precursor

[b] For portion in Federal Lands only

As Table 3 shows, the General Conformity *de minimis* threshold for NOx emissions is exceeded for 2013 and 2014 within the SCAB. No other General Conformity *de minimis* thresholds are exceeded for the Proposed Action. The detailed emission calculations are provided as an attachment (Attachment A) to this analysis.

Operational Emissions

The operational emissions do not increase as a result of the Proposed Action. The Proposed Action replaces existing transmission lines in existing corridors, so the inspection and maintenance requirements do not increase from what is currently required for the existing transmission lines. Also, the fire clearance agreement requirements do not change as a result of the Proposed Action. The negligible normal operating emissions will be mitigated as necessary to comply with SCAQMD, AVAQMD, and KCAPCD rules and regulations. Therefore, it has been determined that the normal operating emissions do not trigger further general conformity analysis.

5.0 STATUS OF APPLICABLE STATE IMPLEMENTATION PLAN

The SCAQMD is required to develop SIPs for criteria pollutants that are classified as nonattainment to meet clean air standards and associated Clean Air Act requirements. The currently approved SIPs for the SCAB are summarized below.

- Ozone (O_3): SIP approved by the USEPA on April 10, 2000 (65 FR 18903), based on the 1997 AQMP and a 1999 amendment to the 1997 AQMP.
- Carbon Monoxide (CO): SIP approved by the USEPA on May 11, 2007 (72 FR 26718), based on the 2005 redesignation request and maintenance plan. In this SIP approval, the USEPA also redesignated the SCAB from nonattainment to attainment/maintenance for CO.
- Particulate Matter Less than 10 Microns (PM_{10}): SIP approved by the USEPA on April 18, 2003 (68 FR 19315), based on the 1997 AQP, amendments to the 1997 AQMP submitted in 1998 and 1999, and further modifications to the 1997 AQMP submitted in a status report to the USEPA in 2002.
- Particulate Matter Less than 2.5 Microns ($PM_{2.5}$): No USEPA-approved SIP.
- Nitrogen Dioxide (NO_2): SIP approved by the USEPA on July 24, 1998 (63 FR 39747), based on the 1997 AQMP. In this SIP approval, the USEPA also redesignated the SCAB from nonattainment to attainment/maintenance for NO_2.

The SCAQMD released the Final 2007 AQMP on June 1, 2007, and as noted above, the AQMP forms the basis of a proposed SIP revision submitted to the USEPA. The SCAQMD is in the process of updating its SIP to address the revisions to the 8-hour O_3 NAAQS and the $PM_{2.5}$ NAAQS. Accordingly, as part of the conformity analysis for the Proposed Action, the USDA Forest Service and the USDOI Bureau of Land Management are requesting that the SCAQMD include the emissions associated with the Proposed Action in its current SIP update. In accordance with the provisions of 40 CFR 93.161, Conformity evaluation for Federal installations with facility-wide emission budgets, the following actions allow for the inclusion of an emissions budget included within the SIP to be used for demonstrating conformity under 93.158(a)(1):

(a) The State, local or tribal agency responsible for implementing and enforcing the SIP or TIP can in cooperation with Federal agencies or third parties authorized by the agency that operate installations subject to Federal oversight develop and adopt a facility-wide emission budget to be used for demonstrating conformity under §93.158(a)(1). The facility-wide budget must meet the following criteria:

(1) Be for a set time period;

(2) Cover the pollutants or precursors of the pollutants for which the area is designated nonattainment or maintenance;

(3) Include specific quantities allowed to be emitted on an annual or seasonal basis;

(4) The emissions from the facility along with all other emissions in the area will not exceed the emission budget for the area;

(5) Include specific measures to ensure compliance with the budget, such as periodic reporting requirements or compliance demonstration, when the Federal agency is taking an action that would otherwise require a conformity determination;

(6) Be submitted to USEPA as a SIP revision;

(7) The SIP revision must be approved by USEPA.

(b) The facility-wide budget developed and adopted in accordance with paragraph (a) of this section can be revised by following the requirements in paragraph (a) of this section.

(c) Total direct and indirect emissions from Federal actions in conjunction with all other emissions subject to General Conformity from the facility that do not exceed the facility budget adopted pursuant to paragraph (a) of this section are "presumed to conform" to the SIP and do not require a conformity analysis.

(d) If the total direct and indirect emissions from the Federal actions in conjunction with the other emissions subject to General Conformity from the facility exceed the budget adopted pursuant to paragraph (a) of this section, the action must be evaluated for conformity. A Federal agency can use the compliance with the facility-wide emissions budget as part of the demonstration of conformity, *i.e.,* the agency would have to mitigate or offset the emissions that exceed the emission budget.

(e) If the SIP for the area includes a category for construction emissions, the negotiated budget can exempt construction emissions from further conformity analysis.

Accordingly, the USDA Forest Service and the USDOI Bureau of Land Management have submitted the emissions estimates for construction of the Proposed Action during Years 2013 and 2014 for inclusion in the SCAQMD's AQMP emissions budget for the SIP update. Inclusion of the emissions budget is for a set time period (2013 and 2014), covers the pollutant for which a conformity determination is required (NOx), and will be submitted as a SIP revision to the USEPA. The USDA Forest Service and the USDOI Bureau of Land Management will monitor emissions through periodic reporting of construction activity associated with the Proposed Action.

6.0 CONFORMITY ANALYSIS

As shown in Table 3, the total NOx emissions from the project construction activities would be greater than the General Conformity *de minimis* emission threshold of 10 tons per year for the SCAB during 2013 and 2014. The NOx threshold of 10 tons per year is based on the SCAB's classification as an extreme ozone nonattainment area. There are two potential procedures for determining conformance for NOx emissions that exceed the applicable *de minimis* thresholds. One procedure is for emissions from the action to be determined and documented by the State agency primarily responsible for the applicable SIP (in this case, the SCAQMD has primary responsibility for the SCAB's portion of the SIP) to not cumulatively result in an exceedance of the emissions budgets specified in the applicable SIP (40 CFR 93.158(a)(5)(i)(A)). The other procedure is to fully offset the total direct and indirect emissions of nonattainment pollutants from the action within the same nonattainment area through an enforceable measure so that there is no net increase in emissions of nonattainment pollutants (40 CFR 93.158(a)(2)).

As discussed in Section 5.0, the USDA Forest Service and the USDOI Bureau of Land Management have submitted the emissions budget to the SCAQMD for inclusion in their SIP update as required under 40 CFR 93.161. The emissions budget will be included in the SIP and the USDA Forest Service and USDOI Bureau of Land Management anticipate that the SIP will be approved prior to reconductoring activities within the SCAB. The USDA Forest Service and USDOI Bureau of Land Management have requested written confirmation from the SCAQMD of the agency's commitment that the emissions will be included in the SIP update.

In lieu of receiving written confirmation from the SCAQMD to demonstrate conformity with the SIP by virtue of the inclusion of construction emissions within the SIP budgets for the SIP update, the Project sponsor (LADWP) will be required to obtain NOx emission offsets to fully offset the NOx emissions during the years when the *de minimis* threshold is exceeded. This measure has been included as an enforceable project mitigation measures in the proposed Project's Draft EIR Document. The measure will be included in the USDA Forest Service and USDOI Bureau of Land Management's ROD, as follows:

Mitigation Measure AQ-4a: General Conformity Offset Mitigation. If the final emission estimate for the selected Project Alternative as provided in the Project's Conformity Analysis exceeds the NOx and/or VOC emission applicability thresholds, and assuming the SCAQMD does not provide confirmation that the Project's emissions are accounted for in the State Implementation Plan (SIP) emission estimates per 40 CFR 93.158(a)(1), then the Project will obtain emission reduction credits to fully offset the NOx and/or VOC emissions per 40 CFR 93.158(a)(2) for the years that the Project has been estimated to exceed the NOx and/or VOC emission applicability thresholds. Credits shall be submitted to the BLM and USFS for review and approval.

LADWP has several options for obtaining emission offset mitigation, including:

- Traditional NOx emission reduction credits (ERCs) that are in units of lbs/day, where 1 lb/day equals 365 lbs/year. These credits can now be subdivided into short-term yearly credits for purchase. These credits are available at market-based prices.
- Reclaim Trading Credits (RTCs) that are in units of lbs and are year specific.
- Creation of new emission reduction credits, such as mobile source emission reduction credits (MSERCs), where considered enforceable by USEPA for purposes of General Conformity offsets, through methods such as the SCAQMD Regulation XVI Mobile Source Offset Programs or other methods similar to existing stationary source control programs such as the Carl Moyer Program.

While there are many options to obtain the necessary offset credits to fully offset the project's NOx emissions, it is likely that RTCs will make up the bulk of the credits obtained by LADWP.

At the discretion of the USDA Forest Service, a revised construction emission estimate for construction activities within the South Coast Air Basin portion of the ANF will be completed and approved by the USDA Forest Service. The offset requirements will be based on the latest USDA Forest Service-approved emission estimate prior to initiation of construction within the ANF, and be based on the applicability thresholds in force at the time of the USDA Forest Service approval of the General Conformity Analysis.

As noted previously as the federal Lead Agencies, the USDA Forest Service and the USDOI Bureau of Land Management will be required to enforce compliance with all mitigation measures contained in their RODs.

7.0 CONCLUSION

As demonstrated in this General Conformity Analysis, the estimated NOx emissions associated with the Proposed Action within the SCAB will exceed the General Conformity *de minimis* threshold for 2013 and 2014. Emissions of other nonattainment pollutants during construction and operation are below their respective General Conformity *de minimis* thresholds for the SCAB and MDAB, as shown in Table 3. Therefore, they are considered to conform to the SIP.

The USDA Forest Service and the USDOI Bureau of Land Management have determined that the Proposed Action conforms to the applicable SIP for NOx emissions within the SCAB through the submittal of the emissions budget to the SCAQMD for inclusion in their update to the SIP for the 8-hour O_3 NAAQS. Assuming the SCAQMD does not provide confirmation that the Project's emissions are accounted for in the SIP emission estimates per 40 CFR 93.158(a)(1), then the Project will obtain emission reduction credits to fully offset the NOx and/or VOC emissions per 40 CFR 93.158(a)(2) for the years that the Project has been estimated to exceed the NOx and/or VOC emission applicability thresholds. Credits shall be submitted to the USDOI Bureau of Land Management and USDA Forest Service for review and approval.

Attachment A

Emission Calculations

Emission Calculation Assumptions

Proposed Project General Assumptions

1) Construction work days and schedule provided by LADWP/Power Engineers.

Offroad Equipment Emission Calculation Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the next highest horsepower sized equipment given in the SCAQMD emission factor database are used for hourly emission factors.

2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.

3) Equipment type, number, and usage estimates are used as estimated using equipment data and quantity estimates are from LADWP/Power Engineers. Equipment requirements were provided based on a 60-mile segment; emissions for each segment/alternative were estimated based on the ratio of the distance for that segment/alternative to 60 miles, assuming a certain emission rate per mile of construction based on heavy equipment and vehicles. It was assumed that the new transmission line would be constructed from end to end, and that one crew per activity would be working on the line at any given location.

4) The following vehicle types, which could be offroad vehicles are assumed to be onroad vehicles considering the project description, needs and location: water trucks and dump trucks.

Onroad Equipment Emission Calculations Assumptions

1) Emission factors derived from the EMFAC2007 Model, for the construction year in which construction occurs. It was assumed that workers would use light-duty trucks. Other vehicles were represented as light-duty trucks (category 1 and 2), medium-duty trucks, and heavy-duty trucks depending on size and usage.

2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.

3) Trip estimates are based on LADWP estimates of crew size and onroad vehicle numbers and trips revised to create a consistent basis given certain variability between construction segment elements.

4) For simplification all onroad traffic for the project is assumed to occur within the jurisdiction of the specific project segment construction element.

Fugitive Dust Emission Calculations Assumptions

1) Unpaved road travel per trip is minimized to the extent feasible and shall range from zero for upgrades to paved substation sites to approximately 7.2 miles for construction segments within the ANF. Unpaved road distances were determined using GIS data for each construction site (tower, staging area, etc.) and employees were assumed to park personal vehicles on unpaved surfaces within staging areas requiring 0.1 mile of unpaved travel.

2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 8.5% on average (USEPA default level for construction site); and 2) average vehicle weight based on VMT estimate for unpaved roads

3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is average for 5000-10000 ADT road; 2) average vehicle weight is calculated on VMT average basis.

4) Earthmoving emission factors are calculated using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).

5) Specific assumptions related to the calculations, such as silt content or silt loading, are noted in the calculation sheets.

Helicopter Emission Calculations Assumptions

1) The type of helicopters and number of helicopter trips for tower helicopter construction are based on estimates provided by Power Engineers.

2) Helicopters were assumed to be used for reconductoring for all alternatives. Helicopters were not assumed to be used for Alternative 2 (Proposed Action). Helicopters were assumed to be used to construct towers for mitigation on Alternative 1 and Alternative 2A.

Emission Estimate Limitations

1) The project schedule has been used to represent when emissions and activity would occur.

2) The actual project construction schedule would have greater variability and activity overlap in each segment or subsegment as problems such as weather or other factors delay work and work delays are later compensated for and as foundation/tower/stringing/restoration crews work sequentially down each segment.

3) Emissions were calculated based on a standard 60-mile transmission line length, and ratios of segment/alternative length were used to calculate specific emissions for each segment/alternative. Emissions and equipment use could vary depending on conditions and distance to tower sites.

4) The annual emissions estimate for each air basin and for the ANF are estimated based on a certain progression and direction of activities in those construction elements that cross borders.

5) There are likely unknown project construction requirements, such as upgrading certain paved roads within the ANF, that are not currently included in the construction assumptions.

6) The helicopter emission factors come from a old source and use engines that do not match the helicopter engines being used, which may cause an overestimation of these emissions depending on the accuracy of the helicopter trip estimate. Unlike large fixed wing aircraft engines helicopter engines do not require emission testing by the ICAO so no new emission factors are readily available.

Table A-1

Summary of Emissions subject to General Conformity Determination

	Miles in Federal Lands	ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
2013							
Alternative 1							
KCAPCD	3.67	0.25	2.73	1.32	0.00	2.79	0.43
AVAQMD	0	0	0	0	0	0	0
SCAQMD	15.91	5.84	31.41	26.70	0.19	14.92	3.21
Alternative 2							
KCAPCD	3.67	0.25	2.73	1.32	0.00	2.79	0.43
AVAQMD	2.2	0.24	2.38	1.63	0.00	4.43	0.76
SCAQMD	12.99	1.04	11.35	6.02	0.01	15.34	2.34
Alternative 2A							
KCAPCD	3.67	0.25	2.73	1.32	0.00	2.79	0.43
AVAQMD	2.2	0.45	2.88	2.14	0.01	1.85	0.35
SCAQMD	12.99	2.34	15.91	11.22	0.06	11.48	2.00
Alternative 3							
KCAPCD	3.67	0.25	2.73	1.32	0.00	2.79	0.43
AVAQMD	0	0.00	0.00	0.00	0.00	0.00	0.00
SCAQMD	2	0.14	1.53	0.73	0.00	1.75	0.26
2014							
Reconductoring							
KCAPCD	3.67	1.27	4.61	5.19	0.04	2.60	0.64
AVAQMD	2.2	0.87	3.38	3.92	0.03	1.65	0.44
SCAQMD	12.99	4.65	16.56	20.56	0.16	5.71	2.00

Table A-2
Construction Heavy Equipment Emissions
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

			Emission Factors												Emission, tons (total)								
Equipment	FUEL	HP	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)	N2O (lb/hr)	No of Equipment	Hrs Per Day	Days in Service	ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)	CO2 tons (total)	CH4 tons (total)	N2O tons (total)
Marshalling Yards - 2013																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	2	270	0.028	0.130	0.210	0.000	0.012	0.011	22	0.003	0.020
Forklift, 5 ton	DIESEL	75	0.0955	0.4327	0.5995	0.0007	0.0529	0.0471196	62.4	0.0086	0.0570	1	6	270	0.077	0.350	0.486	0.001	0.043	0.038	51	0.007	0.046
Forklift, 10 ton	DIESEL	85	0.0955	0.4327	0.5995	0.0007	0.0529	0.0471196	62.4	0.0086	0.0570	1	6	270	0.077	0.350	0.486	0.001	0.043	0.038	51	0.007	0.046
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	1	1	270	0.011	0.416	0.006	0.000	0.000	0.000	1	0.001	0.001
Subtotal															**0.19**	**1.25**	**1.19**	**0.00**	**0.10**	**0.09**	**123.50**	**0.02**	**0.11**
Subtotal Per Mile															**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.00**	**2.06**	**0.00**	**0.00**
Road Work and Structure Pads - 2013																							
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1674	0.7448	1.2529	0.0014	0.0713	0.0634742	121	0.0151	0.1190	2	6	160	0.161	0.715	1.203	0.001	0.068	0.061	116	0.014	0.114
Motor Grader	DIESEL	110	0.1254	0.5310	0.7729	0.0009	0.0676	0.0601332	75.0	0.0113	0.0734	1	3	160	0.030	0.127	0.185	0.000	0.016	0.014	18	0.003	0.018
Backhoe, Silt Fence Trencher/Plow	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	2	6	160	0.067	0.339	0.438	0.001	0.037	0.033	50	0.006	0.042
Excavator, Grade-All	DIESEL	165	0.1208	0.6668	0.8932	0.0013	0.0512	0.0455905	112	0.0109	0.0848	2	4	160	0.077	0.427	0.572	0.001	0.033	0.029	72	0.007	0.054
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	2	4	160	0.090	0.246	0.792	0.001	0.026	0.023	107	0.008	0.075
Subtotal															**0.42**	**1.85**	**3.19**	**0.00**	**0.18**	**0.16**	**362.40**	**0.04**	**0.30**
Subtotal Per Mile															**0.01**	**0.03**	**0.05**	**0.00**	**0.00**	**0.00**	**6.04**	**0.00**	**0.01**
Guard Poles - 2013																							
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	3	35	0.004	0.019	0.024	0.000	0.002	0.002	3	0.000	0.002
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2354	0.7089	2.2485	0.0025	0.0880	0.0783329	223	0.0212	0.2136	1	3	35	0.012	0.037	0.118	0.000	0.005	0.004	12	0.001	0.011
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	3	35	0.005	0.025	0.041	0.000	0.002	0.002	4	0.000	0.004
Subtotal															**0.02**	**0.08**	**0.18**	**0.00**	**0.01**	**0.01**	**19**	**0.00**	**0.02**
Subtotal Per Mile															**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.31**	**0.00**	**0.00**
Foundations and Rebar Cages - 2013																							
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2354	0.7089	2.2485	0.0025	0.0880	0.0783329	223	0.0212	0.2136	2	8	180	0.339	1.021	3.238	0.004	0.127	0.113	321	0.031	0.308
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1674	0.7448	1.2529	0.0014	0.0713	0.0634742	121	0.0151	0.1190	1	4	180	0.060	0.268	0.451	0.000	0.026	0.023	44	0.005	0.043
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	3	180	0.019	0.095	0.123	0.000	0.010	0.009	14	0.002	0.012
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	4	180	0.050	0.138	0.445	0.001	0.015	0.013	60	0.005	0.042
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	2	2	180	0.030	1.110	0.015	0.000	0.001	0.001	2	0.002	0.001
Subtotal															**0.50**	**2.63**	**4.27**	**0.00**	**0.18**	**0.16**	**440**	**0.04**	**0.41**
Subtotal Per Mile															**0.01**	**0.04**	**0.07**	**0.00**	**0.00**	**0.00**	**7.34**	**0.00**	**0.01**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2013																							
Crane, Hydraulic, 150 Ton	DIESEL	250	0.1040	0.2948	0.9948	0.0013	0.0351	0.0312318	112	0.0094	0.0945	1	6	180	0.056	0.159	0.537	0.001	0.019	0.017	61	0.005	0.051
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	4	4	180	0.149	0.694	1.119	0.001	0.064	0.057	116	0.013	0.106
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	2	2	180	0.030	1.110	0.015	0.000	0.001	0.001	2	0.002	0.001
Compressor, Air	Gasoline	75	0.4960	7.9086	1.4021	0.0012	0.0099	0.0088296	128.0617	0.0281	0.1332	6	6	180	1.607	25.624	4.543	0.004	0.032	0.029	415	0.091	0.432
Subtotal															**1.84**	**27.59**	**6.21**	**0.01**	**0.12**	**0.10**	**593**	**0.11**	**0.59**
Subtotal Per Mile															**0.03**	**0.46**	**0.10**	**0.00**	**0.00**	**0.00**	**9.88**	**0.00**	**0.01**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2013																							
Tension Machine, Conductor	DIESEL	135	0.0935	0.5873	0.8011	0.0012	0.0420	0.0373654	107	0.0084	0.0761	1	3	135	0.019	0.119	0.162	0.000	0.009	0.008	22	0.002	0.015
Tension Machine, Static	DIESEL	135	0.0935	0.5873	0.8011	0.0012	0.0420	0.0373654	107	0.0084	0.0761	1	2	135	0.013	0.079	0.108	0.000	0.006	0.005	14	0.001	0.010
Truck, Wire Puller, Rope, 3 Drum	DIESEL	310	0.2170	0.6362	1.7865	0.0027	0.0634	0.0563826	272	0.0196	0.1697	1	3	135	0.044	0.129	0.362	0.001	0.013	0.011	55	0.004	0.034
Truck, Sock Line, Puller, 3 Drum	DIESEL	310	0.2170	0.6362	1.7865	0.0027	0.0634	0.0563826	272	0.0196	0.1697	1	2	135	0.029	0.086	0.241	0.000	0.009	0.008	37	0.003	0.023
Truck, Wire Puller, 1 Drum	DIESEL	310	0.2170	0.6362	1.7865	0.0027	0.0634	0.0563826	272	0.0196	0.1697	1	3	135	0.044	0.129	0.362	0.001	0.013	0.011	55	0.004	0.034
Crawler, Track Type, w/Blade (D8 type)	DIESEL	305	0.2542	0.9504	2.2389	0.0025	0.0868	0.0772959	259	0.0229	0.2127	1	2	135	0.034	0.128	0.302	0.000	0.012	0.010	35	0.003	0.029
Crawler, Track Type, Sagging (D8 type)	DIESEL	305	0.2542	0.9504	2.2389	0.0025	0.0868	0.0772959	259	0.0229	0.2127	2	2	135	0.069	0.257	0.605	0.001	0.023	0.021	70	0.006	0.057
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	2	135	0.009	0.048	0.062	0.000	0.005	0.005	7	0.001	0.006
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	3	3	135	0.063	0.293	0.472	0.001	0.027	0.024	49	0.006	0.045
Helicopter	Jet Fuel											1	6	135	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	4	2	135	0.045	1.665	0.022	0.000	0.001	0.001	3	0.003	0.002
Subtotal															**0.37**	**2.93**	**2.70**	**0.00**	**0.12**	**0.10**	**346.35**	**0.03**	**0.26**
Subtotal Per Mile															**0.01**	**0.05**	**0.04**	**0.00**	**0.00**	**0.00**	**5.77**	**0.00**	**0.00**
Wreck-Out (Conductors, Structures and Foundations)																							
Tension Machine	DIESEL	135	0.0935	0.5873	0.8011	0.0012	0.0420	0.0373654	107	0.0084	0.0761	1	3	135	0.019	0.119	0.162	0.000	0.009	0.008	22	0.002	0.015
Crawler, Track Type, w Blade (D8 type)	DIESEL	305	0.2542	0.9504	2.2389	0.0025	0.0868	0.0772959	259	0.0229	0.2127	1	2	135	0.034	0.128	0.302	0.000	0.012	0.010	35	0.003	0.029
Back Hoe, w/ Concrete Hammer	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	2	135	0.009	0.048	0.062	0.000	0.005	0.005	7	0.001	0.006
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	4	180	0.050	0.138	0.445	0.001	0.015	0.013	60	0.005	0.042
Crane, Hydraulic, 150 Ton	DIESEL	250	0.1040	0.2948	0.9948	0.0013	0.0351	0.0312318	112	0.0094	0.0945	1	6	180	0.056	0.159	0.537	0.001	0.019	0.017	61	0.005	0.051
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	3	3	135	0.063	0.293	0.472	0.001	0.027	0.024	49	0.006	0.045
Helicopter																							
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	4	2	135	0.045	1.665	0.022	0.000	0.001	0.001	3	0.003	0.002
Subtotal															**0.28**	**2.55**	**2.00**	**0.00**	**0.09**	**0.08**	**235.44**	**0.02**	**0.19**
Subtotal Per Mile															**0.00**	**0.04**	**0.03**	**0.00**	**0.00**	**0.00**	**3.92**	**0.00**	**0.00**
Cleanup and Restoration - 2013																							
Truck, Dump, 10 ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	4	135	0.038	0.104	0.334	0.001	0.011	0.010	45	0.003	0.032
Excavator, Grade-All	DIESEL	165	0.1208	0.6668	0.8932	0.0013	0.0512	0.0455905	112	0.0109	0.0848	1	4	135	0.033	0.180	0.241	0.000	0.014	0.012	30	0.003	0.023
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1674	0.7448	1.2529	0.0014	0.0713	0.0634742	121	0.0151	0.1190	1	6	135	0.068	0.302	0.507	0.001	0.029	0.026	49	0.006	0.048
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	1	1	135	0.006	0.208	0.003	0.000	0.000	0.000	0	0.000	0.000
Motor Grader	DIESEL	110	0.1254	0.5310	0.7729	0.0009	0.0676	0.0601332	75.0	0.0113	0.0734	1	6	135	0.051	0.215	0.313	0.000	0.027	0.024	30	0.005	0.030
Subtotal															**0.19**	**1.01**	**1.40**	**0.00**	**0.08**	**0.07**	**155.03**	**0.02**	**0.13**
Subtotal Per Mile															**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.00**	**2.58**	**0.00**	**0.00**

Ta[illegible]A-3
Construction Heavy Equipment Emissions
Alternative 2 - Temporary Transmission Line
Barren Ridge Renewable Transmission Project

			Emission Factors												Emission, tons (total)								
Equipment	FUEL	HP	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)	N2O (lb/hr)	No of Equipment	Hrs Per Day	Days in Service	ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)	CO2 tons (total)	CH4 tons (total)	N2O tons (total)
Marshalling Yards - 2013																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	5	15	0.004	0.018	0.029	0.000	0.002	0.001	3	0.000	0.003
Forklift, 5 ton	DIESEL	75	0.0955	0.4327	0.5995	0.0007	0.0529	0.0471196	62.4	0.0086	0.0570	1	5	15	0.004	0.016	0.022	0.000	0.002	0.002	2	0.000	0.002
Subtotal															**0.01**	**0.03**	**0.05**	**0.00**	**0.00**	**0.00**	**5.35**	**0.00**	**0.00**
Dust Control																							
Water Truck	DIESEL	175	0.1674	0.7448	1.2529	0.0014	0.0713	0.0634742	121	0.0151	0.1190	1	5	58	0.024	0.108	0.182	0.000	0.010	0.009	18	0.002	0.017
Subtotal															**0.02**	**0.11**	**0.18**	**0.00**	**0.01**	**0.01**	**17.57**	**0.00**	**0.02**
Dig Wood Pole Holes - 2013																							
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2354	0.7089	2.2485	0.0025	0.0880	0.0783329	223	0.0212	0.2136	1	6	27	0.019	0.057	0.182	0.000	0.007	0.006	18	0.002	0.017
Subtotal															**0.02**	**0.06**	**0.18**	**0.00**	**0.01**	**0.01**	**18**	**0.00**	**0.02**
Dig and Install Anchor Bolt Foundations - 2013																							
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2354	0.7089	2.2485	0.0025	0.0880	0.0783329	223	0.0212	0.2136	1	6	16	0.011	0.034	0.108	0.000	0.004	0.004	11	0.001	0.010
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	2	16	0.001	0.006	0.007	0.000	0.001	0.001	1	0.000	0.001
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	2	16	0.002	0.006	0.020	0.000	0.001	0.001	3	0.000	0.002
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	1	2	16	0.001	0.049	0.001	0.000	0.000	0.000	0	0.000	0.000
Subtotal															**0.02**	**0.10**	**0.14**	**0.00**	**0.01**	**0.00**	**14**	**0.00**	**0.01**
Haul Wood and Steel Poles - 2013																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	2	15	0.002	0.007	0.012	0.000	0.001	0.001	1	0.000	0.001
Subtotal															**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**1**	**0.00**	**0.00**
Frame/Assemble Wood and Steel Poles - 2013																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	2	15	0.002	0.007	0.012	0.000	0.001	0.001	1	0.000	0.001
Subtotal															**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**1**	**0.00**	**0.00**
Cleanup at Pole Holes and Anchor Bolt Foundation Holes																							
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	3	10	0.001	0.005	0.007	0.000	0.001	0.001	1	0.000	0.001
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	2	10	0.001	0.004	0.012	0.000	0.000	0.000	2	0.000	0.001
Subtotal															**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**1**	**0.00**	**0.00**
Install New Transmission Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2013																							
Tension Machine, Conductor	DIESEL	135	0.0935	0.5873	0.8011	0.0012	0.0420	0.0373654	107	0.0084	0.0761	1	2	10	0.001	0.006	0.008	0.000	0.000	0.000	1	0.000	0.001
Truck, Wire Puller, Rope, 3 Drum	DIESEL	310	0.2170	0.6362	1.7865	0.0027	0.0634	0.0563826	272	0.0196	0.1697	1	2	10	0.002	0.006	0.018	0.000	0.001	0.001	3	0.000	0.002
Truck, Wire Puller, 1 Drum	DIESEL	310	0.2170	0.6362	1.7865	0.0027	0.0634	0.0563826	272	0.0196	0.1697	1	2	10	0.002	0.006	0.018	0.000	0.001	0.001	3	0.000	0.002
Crawler, Track Type, Sagging (D8 type)	DIESEL	305	0.2542	0.9504	2.2389	0.0025	0.0868	0.0772959	259	0.0229	0.2127	1	2	10	0.003	0.010	0.022	0.000	0.001	0.001	3	0.000	0.002
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	2	3.5	10	0.004	0.017	0.027	0.000	0.002	0.001	3	0.000	0.003
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	3	2	10	0.002	0.093	0.001	0.000	0.000	0.000	0	0.000	0.000
Subtotal															**0.01**	**0.03**	**0.07**	**0.00**	**0.00**	**0.00**	**9**	**0.00**	**0.01**
Install New Distribution Services - 2013																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	2	3	10	0.003	0.014	0.023	0.000	0.001	0.001	2	0.000	0.002
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	2	2	10	0.002	0.062	0.001	0.000	0.000	0.000	0	0.000	0.000
Subtotal															**0.00**	**0.08**	**0.02**	**0.00**	**0.00**	**0.00**	**2.51**	**0.00**	**0.00**
Remove Old Wood/Steel Poles																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.1031	0.4821	0.7769	0.0009	0.0445	0.03962	80.3	0.0093	0.0738	1	6	76	0.024	0.110	0.177	0.000	0.010	0.009	18	0.002	0.017
Subtotal															**0.02**	**0.11**	**0.18**	**0.00**	**0.01**	**0.01**	**18.32**	**0.00**	**0.02**
Install and Remove Guard Pole Structures																							
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2354	0.7089	2.2485	0.0025	0.0880	0.0783329	223	0.0212	0.2136	1	3	5	0.002	0.005	0.017	0.000	0.001	0.001	2	0.000	0.002
Back Hoe, w/ Bucket	DIESEL	85	0.0694	0.3529	0.4565	0.0006	0.0383	0.0340819	51.7	0.0063	0.0434	1	4	5	0.001	0.004	0.005	0.000	0.000	0.000	1	0.000	0.000
Truck, Dump, 10 Ton	DIESEL	235	0.1400	0.3837	1.2373	0.0019	0.0412	0.0367012	167	0.0126	0.1175	1	4	5	0.001	0.004	0.012	0.000	0.000	0.000	2	0.000	0.001
Subtotal															**0.00**	**0.01**	**0.03**	**0.00**	**0.00**	**0.00**	**4**	**0.00**	**0.00**

Table A-4
Construction Heavy Equipment Emissions
230 kV Reconductoring
Barren Ridge Renewable Transmission Project

1/28/2014 - 10/28/2014

			Emission Factors												Emission, tons (total)								
Equipment	**FUEL**	**HP**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**Days in Service**	**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**	**CO2 tons (total)**	**CH4 tons (total)**	**N2O tons (total)**
Marshalling Yards - 2014																							
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.0977	0.4806	0.7306	0.0009	0.0412	0.0366241	80.3	0.0088	0.0694	1	2	170	0.017	0.082	0.124	0.000	0.007	0.006	14	0.001	0.012
Forklift, 5 ton	DIESEL	75	0.0877	0.4292	0.5612	0.0007	0.0474	0.0421875	62.4	0.0079	0.0533	1	6	170	0.045	0.219	0.286	0.000	0.024	0.022	32	0.004	0.027
Forklift, 10 ton	DIESEL	85	0.0877	0.4292	0.5612	0.0007	0.0474	0.0421875	62.4	0.0079	0.0533	1	6	170	0.045	0.219	0.286	0.000	0.024	0.022	32	0.004	0.027
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	1	1	170	0.007	0.262	0.004	0.000	0.000	0.000	0	0.000	0.000
Subtotal															**0.11**	**0.78**	**0.70**	**0.00**	**0.06**	**0.05**	**77.76**	**0.01**	**0.07**
Subtotal per mile															**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**1.04**	**0.00**	**0.00**
Road Work and Structure Pads - 2014																							
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1594	0.7413	1.1857	0.0014	0.0663	0.0589875	121	0.0144	0.1126	1	6	60	0.029	0.133	0.213	0.000	0.012	0.011	22	0.003	0.020
Motor Grader	DIESEL	110	0.1166	0.5268	0.7270	0.0009	0.0614	0.0546268	75.0	0.0105	0.0691	1	3	60	0.010	0.047	0.065	0.000	0.006	0.005	7	0.001	0.006
Backhoe, Silt Fence Trencher/Plow	DIESEL	85	0.0634	0.3503	0.4252	0.0006	0.0337	0.0299619	51.7	0.0057	0.0404	1	6	60	0.011	0.063	0.077	0.000	0.006	0.005	9	0.001	0.007
Excavator, Grade-All	DIESEL	165	0.1134	0.6660	0.8323	0.0013	0.0457	0.0407094	112	0.0102	0.0791	1	4	60	0.014	0.080	0.100	0.000	0.005	0.005	13	0.001	0.009
Truck, Dump, 10 Ton	DIESEL	235	0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	167	0.0120	0.1050	1	4	60	0.016	0.045	0.133	0.000	0.004	0.004	20	0.001	0.013
Subtotal															**0.08**	**0.37**	**0.59**	**0.00**	**0.03**	**0.03**	**71.32**	**0.01**	**0.06**
Subtotal per mile															**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.95**	**0.00**	**0.00**
Guard Poles - 2014																							
Back Hoe, w/ Bucket	DIESEL	85	0.0634	0.3503	0.4252	0.0006	0.0337	0.0299619	51.7	0.0057	0.0404	1	3	35	0.003	0.018	0.022	0.000	0.002	0.002	3	0.000	0.002
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2226	0.6786	2.0933	0.0025	0.0813	0.0723907	223	0.0201	0.1989	1	3	35	0.012	0.036	0.110	0.000	0.004	0.004	12	0.001	0.010
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.0977	0.4806	0.7306	0.0009	0.0412	0.0366241	80.3	0.0088	0.0694	1	3	35	0.005	0.025	0.038	0.000	0.002	0.002	4	0.000	0.004
Subtotal															**0.02**	**0.08**	**0.17**	**0.00**	**0.01**	**0.01**	**19**	**0.00**	**0.02**
Subtotal per mile															**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.25**	**0.00**	**0.00**
Wreck-Out (Conductors, Structures and Foundations) - 2014																							
Tension Machine	DIESEL	135	0.0868	0.5867	0.7476	0.0012	0.0374	0.0333234	107	0.0078	0.0710	1	3	105	0.014	0.092	0.118	0.000	0.006	0.005	17	0.001	0.011
Truck, Wire Take Up, Respoiler	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	8	105	0.087	0.258	0.670	0.001	0.024	0.021	114	0.008	0.064
Truck, Sock Line, Puller, 3 Drum	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	4	105	0.043	0.129	0.335	0.001	0.012	0.011	57	0.004	0.032
Truck, Wire Puller, 1 Drum	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	6	105	0.065	0.193	0.502	0.001	0.018	0.016	86	0.006	0.048
Crawler, Track Type, w/Blade (D8 type)	DIESEL	305	0.2420	0.8885	2.0637	0.0025	0.0798	0.071049	259	0.0218	0.1960	1	2	105	0.025	0.093	0.217	0.000	0.008	0.007	27	0.002	0.021
Back Hoe, w/ Concrete Hammer	DIESEL	85	0.0634	0.3503	0.4252	0.0006	0.0337	0.0299619	51.7	0.0057	0.0404	2	8	105	0.053	0.294	0.357	0.001	0.028	0.025	43	0.005	0.034
Truck, Dump, 10 Ton	DIESEL	235	0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	167	0.0120	0.1050	2	8	105	0.111	0.316	0.928	0.002	0.031	0.028	140	0.010	0.088
Crane, Hydraulic, 150 Ton	DIESEL	250	0.0979	0.2817	0.9088	0.0013	0.0317	0.0281935	112	0.0880	0.0863	1	6	105	0.031	0.089	0.286	0.000	0.010	0.009	35	0.028	0.027
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.0977	0.4806	0.7306	0.0009	0.0412	0.0366241	80.3	0.0088	0.0694	2	4	105	0.041	0.202	0.307	0.000	0.017	0.015	34	0.004	0.029
Helicopter	Jet Fuel											1	6	105	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	3	2	105	0.026	0.971	0.013	0.000	0.001	0.001	1	0.001	0.001
Subtotal															**0.50**	**2.64**	**3.73**	**0.01**	**0.16**	**0.14**	**555.27**	**0.07**	**0.35**
Subtotal per mile															**0.01**	**0.04**	**0.05**	**0.00**	**0.00**	**0.00**	**7.40**	**0.00**	**0.00**
Foundations and Rebar Cages - 2014																							
Digger, Transmission Type, Truck Mount	DIESEL	190	0.2226	0.6786	2.0933	0.0025	0.0813	0.0723907	223	0.0201	0.1989	2	8	75	0.134	0.407	1.256	0.002	0.049	0.043	134	0.012	0.119
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1594	0.7413	1.1857	0.0014	0.0663	0.0589875	121	0.0144	0.1126	1	4	75	0.024	0.111	0.178	0.000	0.010	0.009	18	0.002	0.017
Back Hoe, w/ Bucket	DIESEL	85	0.0634	0.3503	0.4252	0.0006	0.0337	0.0299619	51.7	0.0057	0.0404	1	2	75	0.005	0.026	0.032	0.000	0.003	0.002	4	0.000	0.003
Truck, Dump, 10 Ton	DIESEL	235	0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	167	0.0120	0.1050	1	3	75	0.015	0.042	0.124	0.000	0.004	0.004	19	0.001	0.012
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	3	4	75	0.037	1.388	0.019	0.000	0.001	0.001	2	0.002	0.002
Subtotal															**0.21**	**1.97**	**1.61**	**0.00**	**0.07**	**0.06**	**177**	**0.02**	**0.15**
Subtotal per mile															**0.00**	**0.03**	**0.02**	**0.00**	**0.00**	**0.00**	**2.36**	**0.00**	**0.00**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014																							
Crane, Hydraulic, 150 Ton	DIESEL	250	0.0979	0.2817	0.9088	0.0013	0.0317	0.0281935	112	0.0880	0.0863	1	6	90	0.026	0.076	0.245	0.000	0.009	0.008	30	0.024	0.023
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.0977	0.4806	0.7306	0.0009	0.0412	0.0366241	80.3	0.0088	0.0694	4	4	90	0.070	0.346	0.526	0.001	0.030	0.026	58	0.006	0.050
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	2	2	90	0.015	0.555	0.007	0.000	0.000	0.000	1	0.001	0.001
Compressor, Air	Gasoline	75	0.4960	7.9086	1.4021	0.0012	0.0099	0.0088296	128.0617	0.0281	0.1332	6	6	90	0.804	12.812	2.271	0.002	0.016	0.014	207	0.046	0.216
Subtotal															**0.92**	**13.79**	**3.05**	**0.00**	**0.05**	**0.05**	**296**	**0.08**	**0.29**
Subtotal per mile															**0.01**	**0.18**	**0.04**	**0.00**	**0.00**	**0.00**	**3.95**	**0.00**	**0.00**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014																							
Tension Machine, Conductor	DIESEL	135	0.0868	0.5867	0.7476	0.0012	0.0374	0.0333234	107	0.0078	0.0710	1	3	90	0.012	0.079	0.101	0.000	0.005	0.004	14	0.001	0.010
Tension Machine, Static	DIESEL	135	0.0868	0.5867	0.7476	0.0012	0.0374	0.0333234	107	0.0078	0.0710	1	2	90	0.008	0.053	0.067	0.000	0.003	0.003	10	0.001	0.006
Truck, Wire Puller, Rope, 3 Drum	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	3	90	0.028	0.083	0.215	0.000	0.008	0.007	37	0.003	0.020
Truck, Sock Line, Puller, 3 Drum	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	2	90	0.019	0.055	0.144	0.000	0.005	0.005	25	0.002	0.014
Truck, Wire Puller, 1 Drum	DIESEL	310	0.2065	0.6134	1.5945	0.0027	0.0567	0.0504704	272	0.0186	0.1515	1	3	90	0.028	0.083	0.215	0.000	0.008	0.007	37	0.003	0.020
Crawler, Track Type, w/Blade (D8 type)	DIESEL	305	0.2420	0.8885	2.0637	0.0025	0.0798	0.071049	259	0.0218	0.1960	1	2	90	0.022	0.080	0.186	0.000	0.007	0.006	23	0.002	0.018
Crawler, Track Type, Sagging (D8 type)	DIESEL	305	0.2420	0.8885	2.0637	0.0025	0.0798	0.071049	259	0.0218	0.1960	2	2	90	0.044	0.160	0.371	0.000	0.014	0.013	47	0.004	0.035
Back Hoe, w/ Bucket	DIESEL	85	0.0634	0.3503	0.4252	0.0006	0.0337	0.0299619	51.7	0.0057	0.0404	1	2	90	0.006	0.032	0.038	0.000	0.003	0.003	5	0.001	0.004
Crane, Hydraulic, Rough Terrain, 35 Ton	DIESEL	125	0.0977	0.4806	0.7306	0.0009	0.0412	0.0366241	80.3	0.0088	0.0694	3	3	90	0.040	0.195	0.296	0.000	0.017	0.015	33	0.004	0.028
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	4	2	90	0.030	1.110	0.015	0.000	0.001	0.001	2	0.002	0.001
Subtotal															**0.16**	**0.62**	**1.34**	**0.00**	**0.05**	**0.05**	**197**	**0.01**	**0.13**
Subtotal per mile															**0.00**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**2.62**	**0.00**	**0.00**
Cleanup and Restoration - 2014																							
Truck, Dump, 10 ton	DIESEL	235	0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	167	0.0120	0.1050	1	4	85	0.023	0.064	0.188	0.000	0.006	0.006	28	0.002	0.018
Excavator, Grade-All	DIESEL	165	0.1134	0.6660	0.8323	0.0013	0.0457	0.0407094	112	0.0102	0.0791	1	4	85	0.019	0.113	0.141	0.000	0.008	0.007	19	0.002	0.013
Crawler, Track Type, w/Blade (D6 type)	DIESEL	165	0.1594	0.7413	1.1857	0.0014	0.0663	0.0589875	121	0.0144	0.1126	1	6	85	0.041	0.189	0.302	0.000	0.017	0.015	31	0.004	0.029
Motor, Auxiliary Power	Gasoline	5	0.0829	3.0838	0.0412	0.0001	0.0025	0.0022172	4.7333	0.0047	0.0039	1	1	85	0.004	0.131	0.002	0.000	0.000	0.000	0	0.000	0.000
Motor Grader	DIESEL	110	0.1166	0.5268	0.7270	0.0009	0.0614	0.0546268	75.0	0.0105	0.0691	1	4	85	0.020	0.090	0.124	0.000	0.010	0.009	13	0.002	0.012
Subtotal															**0.11**	**0.59**	**0.76**	**0.00**	**0.04**	**0.04**	**91.24**	**0.01**	**0.07**
Subtotal per mile															**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**1.22**	**0.00**	**0.00**
														Total lbs/da	**2.111**	**20.842**	**11.945**	**0.016**	**0.468**	**0.417**	**1483.985**	**0.207**	**1.135**

Table A-5
Fugitive Dust Emission Calculation Assumptions
Barren Ridge Renewable Transmission Project

Activity Assumptions for Fugitive Dust Sources	Segment						
	A	**B**	**C**	**D**	**G**	**G/2A**	**I**
Proposed Activity Sites and Areas							
Transmission Line Distance, Miles	13.25	26.5	21.68	48	20.8	6.6	31.86
Portion of line in KCAPCD	1	0.766	1	0.261			
Portion of line in AVAQMD		0.234		0.275	0.298	0.4848485	0.556
Portion of line in SCAQMD				0.464	0.702	0.5151515	0.444
Access Roads							
Transmission Line Access Roads, miles	19.88	39.75	31.89	108.525	73.685	23.380817	128.26
Staging Areas (assume 1 per mile)	Acres of disturbance						
Assume 1 acre per staging area	13.00	26.00	21.00	48.00	20.00	6.00	31.00
Portable Helicopter Landing Sites (Segments D, G/2A, and H Only)							
4 per mile, 20 x 20 feet, clearing of 0.73 acres				28.032		12.556	
Pullout Sites							
7 total				7		7	
Fly Yards							
Type I - 0.02 acres (assume all Type I for conservative purposes)				0.192		0.086	
Fueling Station - assume 3 - 4.6 acres				13.8		13.8	
Hydrant Yard - 32 acres				32		32	
Reitano Yard - 23 acres				23		23	
Wire Stringing Sites							
Assume 1 per mile, 0.74 acres per site				7.104		3.182	
Fueling Sites							
0.66 acres per mile				6.336		2.838	
Transmission Structure Sites							
Assume average of 5 per mile, 1 acre per site plus 0.22 ac	80.83	161.65	132.25	292.80	126.88	40.26	194.35
Guard Structure at Major Crossings							
0.3 acres per mile	3.98	7.95	6.50	14.40	6.24	1.98	9.56
Total Disturbed Acreage	97.80	195.60	159.75	355.20	153.12	48.24	234.90
Maximum Disturbed Acreage - Current Estimates	86.45	172.25	209.3	303.64	140.15	41.46	261.07
Transmission Structures	Cubic Yards of Excavation						
Assume average of 4.5 per mile	59	119	97	216	93	29	143
Assume 35 cubic yards per structure	2065	4165	3395	7560	3255	1015	5005
Assume an average of 7 structures excavated per day							
Total cubic yards/day = 245							

Table A-6
Fugitive Dust Emissions by Activity
Barren Ridge Renewable Transmission Project

Staging Areas and Transmission Pole Sites							
Source: "Improvement of Specific Emission Factors (BACM Project No. 1) Final Report" (MRI 1996)							
	Activity Days/Month		22				
E = Level 2 factor = tons PM10/acre-month	0.011	tons/acre-day					
F = 0.21 for PM2.5	0.00231	tons/acre-day					
Control Effectiveness = 61% (watering 3x daily)							
Segment	A	B	C	D	G	G/2A	I
Total Acreage Disturbed	97.80	195.60	159.75	465.66	153.12	135.70	234.90
Acres/month	8.15	16.30	13.31	38.81	12.76	11.31	19.58
Acres/day	0.37	0.74	0.61	1.76	0.58	0.51	0.89
PM10, total tons	0.42	0.84	0.69	2.00	0.66	0.58	1.01
PM2.5, total tons	0.09	0.18	0.14	0.42	0.14	0.12	0.21
PM10, lbs/day	3.18	6.36	5.19	15.13	4.98	4.41	7.63
PM2.5, lbs/day	0.67	1.33	1.09	3.18	1.05	0.93	1.60
Grading of Proposed Access Roads							
Source: URBEMIS Model, Version 9.2.4 (Rimpo and Associates 2007)							
E =	20	lbs/acre-day					
Assume grading required for 20 feet width							
Control Effectiveness = 61% (watering 3x daily)							
Segment	A	B	C	D	G	G/2A	I
Minus Mileage for Helicopter Construction				9.60		4.30	
Acres of grading required	48.18	96.36	77.31	239.82	178.63	46.26	310.93
Acres/month	4.02	8.03	6.44	19.98	14.89	3.85	25.91
Acres/day	0.18	0.37	0.29	0.91	0.68	0.18	1.18
PM10, total tons	0.19	0.38	0.30	0.94	0.70	0.18	1.21
PM2.5, total tons	0.04	0.08	0.06	0.20	0.15	0.04	0.25
PM10, lbs/day	1.42	2.85	2.28	7.09	5.28	1.37	9.19
PM2.5, lbs/day	0.30	0.60	0.48	1.49	1.11	0.29	1.93
Excavation							
Source: SCAQMD CEQA Handbook, Table A9-9-F							
PM10 E = 0.75 x 0.0021 (d^0.7)/(M^0.3)	0.0023057	lbs PM10/yd3					
PM2.5 E = 0.017 x 0.0021 (d^0.7)/(M^0.3)	5.226E-05	lbs PM2.5/yd3					
d = drop height = 5 ft (estimated							
M = 12%							
Segment	A	B	C	D	G	G/2A	I
Cubic yards of excavation	2065	4165	3395	7560	3255	1015	5005
Cubic yards/day maximum	245	245	245	245	245	245	245
PM10, total tons	0.00	0.00	0.00	0.01	0.00	0.00	0.01
PM2.5, total tons	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10, lbs/day	0.56	0.56	0.56	0.56	0.56	0.56	0.56
PM2.5, lbs/day	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Dozer							
Source: AP-42, Section 11.9, removal of overburden							
E = k x (s)^1.5/(M)^1.4 for PM10	1.91	lb/hr					
E = k x 5.7 x (s)^1.2/(M)^1.3 for PM2.5	0.84	lb/hr					
s = 16% (farm roads)							
M = 10% (assuming watering for mitigation)							
Total Hours of Dozer Use for 60-mile segment	4260						
Hours of Dozer Use per Segment							
Maximum Hours/day of Dozer Use	12.00						
Segment	A	B	C	D	G	G/2A	I
PM10, total tons	0.90	1.80	1.47	3.26	1.41	0.45	2.16
PM2.5, total tons	0.39	0.79	0.64	1.42	0.62	0.20	0.95
PM10, lbs/day	22.93	22.93	22.93	22.93	22.93	22.93	22.93
PM2.5, lbs/day	10.03	10.03	10.03	10.03	10.03	10.03	10.03
Total Fugitive Dust per Segment	A	B	C	D	G	G/2A	I
PM10, lbs/day	28.10	32.70	30.97	45.72	33.75	29.27	40.32
PM2.5, lbs/day	11.01	11.97	11.61	14.71	12.19	11.25	13.57
PM10, total tons	1.51	3.02	2.46	6.20	2.77	1.21	4.39
PM2.5, total tons	0.52	1.04	0.85	2.04	0.90	0.36	1.41

Construction Worker Commute Emission Calculations
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

		No. of Workers	Speed	VMT	CO		NO$_x$		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
Construction Phase	Vehicle Class	Per Construction Phase	(mph)	(mi/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}
Construction Inspection - 2013	Light-Duty Truck	6	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Marshalling Yards - 2013	Light-Duty Truck	6	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Survey (Roads, Pads and Structure Locations) - 2013	Light-Duty Truck	2	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Road Work and Structure Pads - 2013	Light-Duty Truck	5	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Guard Poles - 2013	Light-Duty Truck	6	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Foundations and Rebar Cages - 2013	Light-Duty Truck	20	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2013	Light-Duty Truck	63	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2013	Light-Duty Truck	27	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Wreck-Out (Conductors, Structures and Foundations)	Light-Duty Truck	38	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04
Cleanup and Restoration - 2013	Light-Duty Truck	5	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04

		Total Emissions, tons												
Construction Phase	Construction Days	CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Construction Inspection - 2013	270	0.37	0.04	0.01833	5.79E-04	0.00463	0.00248	0.00684	0.00144	1.73686	0.17369	56	0.00298	0.00341
Marshalling Yards - 2013	270	0.37	0.04	0.01833	5.79E-04	0.00463	0.00248	0.00684	0.00144	1.73686	0.17369	56	0.00298	0.00341
Survey (Roads, Pads and Structure Locations) - 2013	160	0.07	0.01	0.00362	1.14E-04	0.00091	0.00049	0.00135	0.00028	0.34308	0.03431	11	0.00059	0.00067
Road Work and Structure Pads - 2013	160	0.18	0.02	0.00905	2.86E-04	0.00229	0.00122	0.00338	0.00071	0.85771	0.08577	27	0.00147	0.00168
Guard Poles - 2013	35	0.05	0.00	0.00238	7.50E-05	0.00060	0.00032	0.00089	0.00019	0.22515	0.02251	7	0.00039	0.00044
Foundations and Rebar Cages - 2013	180	0.82	0.08	0.04074	1.29E-03	0.01029	0.00551	0.01519	0.00319	3.85969	0.38597	124	0.00662	0.00758
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2013	180	2.59	0.25	0.12834	4.05E-03	0.03240	0.01735	0.04785	0.01005	12.15802	1.21580	389	0.02085	0.02387
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2013	135	0.83	0.08	0.04125	1.30E-03	0.01041	0.00558	0.01538	0.00323	3.90794	0.39079	125	0.00670	0.00767
Wreck-Out (Conductors, Structures and Foundations)	135	1.17	0.11	0.05806	1.83E-03	0.01466	0.00785	0.02164	0.00455	5.50006	0.55001	176	0.00943	0.01080
Cleanup and Restoration - 2013	135	0.15	0.01	0.00764	2.41E-04	0.00193	0.00103	0.00285	0.00060	0.72369	0.07237	23	0.00124	0.00142
Total Vehicle Emissions		6.63	0.64	0.33	0.01	0.08	0.04	0.12	0.03	31.05	3.10	994.55	0.05	0.06
lbs/mile		0.1104316	0.010693	0.0054626	0.0001724	0.0013791	0.0007385	0.002037	0.000428	0.517484	0.051748	16.57585	0.000887	

Assume startup after 8 hours
Assume 45 minutes run time total
2009 Emission Factors from EMFAC2007, average temp 60F; South Coast Air Basin

Table A-8
Construction Worker Commute Emission Calculations
Alternative 2 Temporary Transmission Line
Barren Ridge Renewable Transmission Project

Construction Phase	Vehicle Class	No. of Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO$_x$		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O		Construction Days
					Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	
Survey - 2013	Light-Duty Truck	1	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	15
Marshalling Yards - 2013	Light-Duty Truck	3	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	15
Flagmen - 2013	Light-Duty Truck	2	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	15
Dust Control - 2013	Light-Duty Truck	1	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	58
Dig Wood Pole Holes - 2013	Light-Duty Truck	2	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	27
Dig and Install Anchor Bolt Foundations - 2013	Light-Duty Truck	11	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	16
Haul Wood and Steel Poles - 2013	Light-Duty Truck	5	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	15
Frame/Assemble	Light-Duty Truck	4	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	15
Cleanup at Pole Holes and Anchor Bolt Foundations	Light-Duty Truck	3	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	10
Install New Sub Transmission and Distribution Conductors	Light-Duty Truck	22	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	10
Install New Distribution Services	Light-Duty Truck	9	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	10
Remove Old Wood/Steel Poles	Light-Duty Truck	7	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	76
Install and Remove Guard Pole Structures	Light-Duty Truck	9	35	80	2.391	8.139	0.242	0.369	0.075	0.585	0.214	0.027	0.043	0.052	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.014	0.002	0.005	384.486	197.855	0.02	0.034	0.02	0.04	5
Total																										Total Vehicle Emissions					
																											lbs/mile				

Construction Phase	Total Emissions, tons												
	CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Survey - 2013	0.00	0.00	0.00017	5.36E-06	0.00004	0.00002	0.00006	0.00001	0.01608	0.00161	1	0.00003	0.00003
Marshalling Yards - 2013	0.01	0.00	0.00051	1.61E-05	0.00013	0.00007	0.00019	0.00004	0.04825	0.00482	2	0.00008	0.00009
Flagmen - 2013	0.01	0.00	0.00034	1.07E-05	0.00009	0.00005	0.00013	0.00003	0.03216	0.00322	1	0.00006	0.00006
Dust Control - 2013	0.01	0.00	0.00066	2.07E-05	0.00017	0.00009	0.00024	0.00005	0.06218	0.00622	2	0.00011	0.00012
Dig Wood Pole Holes - 2013	0.01	0.00	0.00061	1.93E-05	0.00015	0.00008	0.00023	0.00005	0.05790	0.00579	2	0.00010	0.00011
Dig and Install Anchor Bolt Foundations - 2013	0.04	0.00	0.00199	6.29E-05	0.00050	0.00027	0.00074	0.00016	0.18870	0.01887	6	0.00032	0.00037
Haul Wood and Steel Poles - 2013	0.02	0.00	0.00085	2.68E-05	0.00021	0.00011	0.00032	0.00007	0.08041	0.00804	3	0.00014	0.00016
Frame/Assemble	0.01	0.00	0.00068	2.14E-05	0.00017	0.00009	0.00025	0.00005	0.06433	0.00643	2	0.00011	0.00013
Cleanup at Pole Holes and Anchor Bolt Foundations	0.01	0.00	0.00034	1.07E-05	0.00009	0.00005	0.00013	0.00003	0.03216	0.00322	1	0.00006	0.00006
Install New Sub Transmission and Distribution Conductors	0.05	0.00	0.00249	7.86E-05	0.00063	0.00034	0.00093	0.00019	0.23587	0.02359	8	0.00040	0.00046
Install New Distribution Services	0.02	0.00	0.00102	3.21E-05	0.00026	0.00014	0.00038	0.00008	0.09649	0.00965	3	0.00017	0.00019
Remove Old Wood/Steel Poles	0.12	0.01	0.00602	1.90E-04	0.00152	0.00081	0.00224	0.00047	0.57038	0.05704	18	0.00098	0.00112
Install and Remove Guard Pole Structures	0.01	0.00	0.00051	1.61E-05	0.00013	0.00007	0.00019	0.00004	0.04825	0.00482	2	0.00008	0.00009
Total (Total Vehicle Emissions)	**0.33**	**0.03**	**0.02**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**1.53**	**0.15**	**49.11**	**0.00**	**0.00**
lbs/mile	0.0054529	0.000528	0.0002697	8.512E-06	6.81E-05	3.647E-05	0.000101	2.11E-05	0.025553	0.002555	0.81849	4.38E-05	

Assume startup after 8 hours
Assume 45 minutes run time total

Construction Worker Commute Emission Calculations
230 kV Reconductoring
Barren Ridge Renewable Transmission Project

Construction Phase	Vehicle Class	No. of Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/start)ª	Running Exhaust (g/mi)	Start-Up (g/start)ª	Running Exhaust (g/mi)	Start-Up (g/start)ª	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)ª	Running Exhaust (g/mi)	Start-Up (g/start)ª	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)ª	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)ª	Running Exhaust (g/mi)	Start-Up (g/start)ª	Running Exhaust (g/mi)	Start-Up (g/start)ª
Construction Inspection - 2014	Light-Duty Truck	6	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Marshalling Yards - 2014	Light-Duty Truck	6	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Survey (Roads, Pads and Structure Locations) - 2014	Light-Duty Truck	2	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Road Work and Structure Pads - 2014	Light-Duty Truck	5	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Guard Poles - 2014	Light-Duty Truck	6	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Wreck-Out (Conductors, Structure and Foundations) - 2014	Light-Duty Truck	38	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Foundations and Rebar Cages - 2014	Light-Duty Truck	20	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014	Light-Duty Truck	63	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014	Light-Duty Truck	27	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03
Cleanup and Restoration - 2014	Light-Duty Truck	5	35	80	2.169	7.537	0.218	0.34	0.063	0.533	0.211	0.026	0.04	0.05	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.242	197.776	0.018	0.031	0.02	0.03

Construction Phase	Construction Days	Total Emissions, tons														
		CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Construction Inspection - 2014	170	0.21	0.02	0.01015	3.64E-04	0.00291	0.00156	0.00430	0.00090	1.09358	0.10936	35	0.00169	0.00194
Marshalling Yards - 2014	170	0.21	0.02	0.01015	3.64E-04	0.00291	0.00156	0.00430	0.00090	1.09358	0.10936	35	0.00169	0.00194
Survey (Roads, Pads and Structure Locations) - 2014	60	0.02	0.00	0.00119	4.29E-05	0.00034	0.00018	0.00051	0.00011	0.12866	0.01287	4	0.00020	0.00023
Road Work and Structure Pads - 2014	60	0.06	0.01	0.00299	1.07E-04	0.00086	0.00046	0.00127	0.00027	0.32164	0.03216	10	0.00050	0.00057
Guard Poles - 2014	35	0.04	0.00	0.00209	7.50E-05	0.00060	0.00032	0.00089	0.00019	0.22515	0.02251	7	0.00035	0.00040
Wreck-Out (Conductors, Structure and Foundations) - 2014	105	0.83	0.08	0.03971	1.43E-03	0.01140	0.00611	0.01683	0.00354	4.27782	0.42778	137	0.00661	0.00757
Foundations and Rebar Cages - 2014	75	0.31	0.03	0.01493	5.36E-04	0.00429	0.00230	0.00633	0.00133	1.60820	0.16082	51	0.00248	0.00285
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014	90	1.18	0.11	0.05643	2.03E-03	0.01620	0.00869	0.02392	0.00502	6.07901	0.60790	195	0.00939	0.01076
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014	90	0.51	0.05	0.02419	8.68E-04	0.00694	0.00372	0.01025	0.00215	2.60529	0.26053	83	0.00402	0.00461
Cleanup and Restoration - 2014	85	0.09	0.01	0.00423	1.52E-04	0.00121	0.00065	0.00179	0.00038	0.45566	0.04557	15	0.00070	0.00081
Total Worker Vehicles		**3.47**	**0.33**	**0.17**	**0.01**	**0.05**	**0.03**	**0.07**	**0.01**	**17.89**	**1.79**	**572.64**	**0.03**	**0.03**

Assume startup after 8 hours
Assume 45 minutes run time total
2009 Emission Factors from EMFAC2007, average temp 60F; South Coast Air Basin

Table A-10
Construction Truck Trip Emissions
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

Construction Phase	Vehicle Class	No. of Trucks per day	Speed	VMT	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O		Construction Days	Total Emissions, tons											
			(mph)	(mi/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]		CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4
Construction Inspection - 2013																																											
Truck, Pick-Up	Light Duty Truck 1, Catalyst	6	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	270	0.32	0.03	0.01207	5.79E-04	0.00449	0.00248	0.00684	0.00144	1.74	0.17369	56	0.00268
Subtotal																																**0.31695**	**0.02832**	**0.01207**	**0.00058**	**0.00449**	**0.00248**	**0.00684**	**0.00144**	**1.74**	**0.17369**	**56**	**0.00268**
Marshalling Yards - 2013																																											
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		270	0.08	0.26	0.01679	4.05E-04	0.01007	0.00838	0.20312	0.04266	0.82	0.08159	44	0.00079
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	270	0.11	0.01	0.00402	1.93E-04	0.00150	0.00083	0.00228	0.00048	0.58	0.05790	19	0.00089
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	270	0.05	0.00	0.00201	9.64E-05	0.00075	0.00041	0.00114	0.00024	0.29	0.02895	9	0.00045
Subtotal																																**0.24**	**0.27**	**0.02**	**0.00**	**0.01**	**0.01**	**0.21**	**0.04**	**1.68**	**0.17**	**71.38**	**0.00**
Survey (Roads, Pads and Structure Location) - 2013																																											
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	160	0.03	0.00	0.00119	5.71E-05	0.00044	0.00025	0.00068	0.00014	0.17154	0.01715	6	0.00026
																																0.03130	**0.00280**	**0.00119**	**0.00006**	**0.00044**	**0.00025**	**0.00068**	**0.00014**	**0.17154**	**0.01715**	**6**	**0.00026**
Road Work and Structure Pads - 2013																																											
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		160	0.05	0.15	0.00995	2.40E-04	0.00597	0.00497	0.12037	0.02528	0.48347	0.04835	26	0.00047
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		160	0.02	0.07	0.00230	1.98E-04	0.00310	0.00264	0.06154	0.01292	0.39827	0.03983	21	0.00011
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		160	0.01	0.02	0.00095	4.23E-05	0.00092	0.00066	0.00068	0.00014	0.17154	0.01715	5	0.00004
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		160	0.01	0.02	0.00095	4.23E-05	0.00092	0.00066	0.00068	0.00014	0.17154	0.01715	5	0.00004
Subtotal																																**0.08**	**0.26**	**0.01**	**0.00**	**0.01**	**0.01**	**0.18**	**0.04**	**1.22**	**0.12**	**56.82**	**0.00**
Guard Poles - 2013																																											
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		35	0.00	0.01	0.00053	1.54E-05	0.00019	0.00013	0.02633	0.00553	0.08712	0.00871	2	0.00002
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		35	0.00	0.01	0.00053	1.54E-05	0.00019	0.00013	0.02633	0.00553	0.08712	0.00871	2	0.00002
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		35	0.01	0.03	0.00218	5.25E-05	0.00131	0.00109	0.02633	0.00553	0.10576	0.01058	6	0.00010
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	2	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		35	0.00	0.01	0.00041	1.85E-05	0.00040	0.00029	0.00030	0.00006	0.07505	0.00750	2	0.00002
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		35	0.00	0.00	0.00021	9.26E-06	0.00020	0.00015	0.00015	0.00003	0.03752	0.00375	1	0.00001
Subtotal																																**0.02**	**0.07**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.02**	**0.39**	**0.04**	**12.11**	**0.00**
Foundations and Rebar Cages - 2013																																											
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	1	35	80	0.54		1.161		0.1						0.003		0.07		0.008	0.013	0.064		0.002	0.005	350.437		0.005		0.11		180	0.01	0.02	0.00159	4.76E-05	0.00144	0.00113	0.00076	0.00016	0.19298	0.01930	6	0.00008
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	4	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		180	0.09	0.32	0.01035	8.89E-04	0.01397	0.01187	0.27693	0.05816	1.79223	0.17922	96	0.00051
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	2	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		180	0.02	0.11	0.00543	1.59E-04	0.00200	0.00137	0.27083	0.05687	0.89611	0.08961	17	0.00025
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		180	0.06	0.17	0.01119	2.70E-04	0.00671	0.00559	0.13542	0.02844	0.54390	0.05439	29	0.00052
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		180	0.02	0.08	0.00259	2.22E-04	0.00349	0.00297	0.06923	0.01454	0.44806	0.04481	24	0.00013
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		180	0.01	0.02	0.00106	4.76E-05	0.00103	0.00075	0.00076	0.00016	0.19298	0.01930	6	0.00005
Truck, Pick-Up	Light Duty Truck 1, Diesel	2	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		180	0.01	0.04	0.00213	9.52E-05	0.00206	0.00149	0.00152	0.00032	0.38597	0.03860	11	0.00010
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	3	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		180	0.02	0.06	0.00319	1.43E-04	0.00310	0.00224	0.00228	0.00048	0.57895	0.05790	17	0.00014
Subtotal																																**0.24**	**0.81**	**0.04**	**0.00**	**0.03**	**0.03**	**0.76**	**0.16**	**5.03**	**0.50**	**203.79**	**0.00**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2013																																											
Truck, Flatbed, 2 1/2 Ton	Light Duty Truck 2, Catalyst	2	35	80	2.231	8.753	0.3	0.624	0.042	0.673	0.194	0.025	0.042	0.05	0.004	0.002	0.021	0.031	0.008	0.013	0.019	0.028	0.002	0.005	386.555	202.664	0.023	0.041	0.03	0.06	180	0.08	0.01	0.00305	1.29E-04	0.00136	0.00085	0.00152	0.00032	0.38597	0.03860	12	0.00076
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	180	0.07	0.01	0.00268	1.29E-04	0.00100	0.00055	0.00152	0.00032	0.38597	0.03860	12	0.00060
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	8	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	180	0.28	0.03	0.01073	5.14E-04	0.00399	0.00221	0.00608	0.00128	1.54388	0.15439	50	0.00238
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		180	0.02	0.08	0.00259	2.22E-04	0.00349	0.00297	0.06923	0.01454	0.44806	0.04481	24	0.00013
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		180	0.01	0.02	0.00106	4.76E-05	0.00103	0.00075	0.00076	0.00016	0.19298	0.01930	6	0.00005
Subtotal																																**0.46**	**0.14**	**0.02**	**0.00**	**0.01**	**0.01**	**0.08**	**0.02**	**2.96**	**0.30**	**103.74**	**0.00**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2013																																											
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	5	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.04	0.20	0.01018	2.98E-04	0.00375	0.00256	0.50781	0.10664	1.68021	0.16802	31	0.00048
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.01	0.04	0.00204	5.95E-05	0.00075	0.00051	0.10156	0.02133	0.33604	0.03360	6	0.00010
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	2	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		135	0.08	0.26	0.01679	4.05E-04	0.01007	0.00838	0.20312	0.04266	0.81586	0.08159	44	0.00079
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		135	0.02	0.06	0.00194	1.67E-04	0.00262	0.00223	0.05192	0.01090	0.33604	0.03360	18	0.00010
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	8	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	135	0.21	0.02	0.00805	3.86E-04	0.00299	0.00165	0.00456	0.00096	1.15791	0.11579	37	0.00179
Truck, Pick-Up	Light Duty Truck 1, Catalyst	4	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	135	0.11	0.01	0.00402	1.93E-04	0.00150	0.00083	0.00228	0.00048	0.57895	0.05790	19	0.00089
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	2	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		135	0.01	0.03	0.00160	7.14E-05	0.00155	0.00112	0.00114	0.00024	0.28948	0.02895	8	0.00007
Truck, Fuel (Helicopter Support)	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		135	0.02	0.06	0.00194	1.67E-04	0.00262	0.00223	0.05192	0.01090	0.33604	0.03360	18	0.00010
Subtotal																																**0.50**	**0.67**	**0.02**	**0.00**	**0.01**	**0.01**	**0.11**	**0.02**	**2.70**	**0.27**	**99.81**	**0.00**
Wreck-Out (Conductors, Structures and Foundations)																																											
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	3	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.03	0.12	0.00611	1.79E-04	0.00225	0.00154	0.30469	0.06398	1.00813	0.10081	19	0.00029
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	3	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.03	0.12	0.00611	1.79E-04	0.00225	0.00154	0.30469	0.06398	1.00813	0.10081	19	0.00029
Truck, Wire Take Up, Respoiler	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.01	0.04	0.00204	5.95E-05	0.00075	0.00051	0.10156	0.02133	0.33604	0.03360	6	0.00010
Truck, Sock Line, Puller, 3 Drum	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		135	0.01	0.04	0.00204	5.95E-05	0.00075	0.00051	0.10156	0.02133	0.33604	0.03360	6	0.00010
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	3	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		135	0.12	0.38	0.02518	6.07E-04	0.01511	0.01257	0.30469	0.06398	1.22378	0.12238	65	0.00118
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		135	0.02	0.06	0.00194	1.67E-04	0.00262	0.00223	0.05192	0.01090	0.33604	0.03360	18	0.00010
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	4	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	135	0.11	0.01	0.00402	1.93E-04	0.00150	0.00083	0.00228	0.00048	0.57895	0.05790	19	0.00089
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	135	0.05	0.00	0.00201	9.64E-05	0.00075	0.00041	0.00114	0.00024	0.28948	0.02895	9	0.00045
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		135	0.01	0.01	0.00080	3.57E-05	0.00077	0.00056	0.00057	0.00012	0.14474	0.01447	4	0.00004
Truck, Fuel (Helicopter Support)	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		135	0.02	0.06	0.00194	1.67E-04	0.00262	0.00223	0.05192	0.01090	0.33604	0.03360	18	0.00010
Subtotal																																**0.39**	**0.85**	**0.01**	**0.00**	**0.01**	**0.01**	**0.11**	**0.02**	**1.69**	**0.17**	**67.82**	**0.00**
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		135	0.04	0.13	0.00839	2.02E-04	0.00504	0.00419	0.10156	0.02133	0.40793	0.04079	22	0.00039
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		135	0.01	0.01	0.00080	3.57E-05	0.00077	0.00056	0.10156	0.02133	0.40793	0.04079	4	0.00004
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		135	0.01	0.01	0.00080	3.57E-05	0.00077	0.00056	0.10156	0.02133	0.40793	0.04079	4	0.00004
Subtotal																																**0.05**	**0.16**	**0.01**	**0.00**	**0.01**	**0.01**	**0.30**	**0.06**	**1.22**	**0.12**	**30.02**	**0.00**
																																1.94	**2.40**	**0.14**	**0.01**	**0.09**	**0.07**	**1.73**	**0.36**	**17.12**	**1.71**	**638.89**	**0.02**
																											lbs/mile				tons/mile	0.03	0.04	0.00	0.00	0.00	0.00	0.03	0.01	0.29	0.03	10.65	0.00

Assume startup after 8 hours

Construction Truck Trip Emissions
Alternative 2 Temporary Transmission Line
Barren Ridge Renewable Transmission Project

Construction Phase	Vehicle Class	No. of Trucks per day	Speed	VMT	CO		NO$_x$		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O		Construction Days	Total Emissions, tons											
			(mph)	(mi/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}		CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4
Survey - 2013																																											
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	15	0.00	0.00	0.00011	5.36E-06	0.00004	0.00002	0.00006	0.00001	0.02	0.00161	1	0.00002
Subtotal																																0.00293	0.00026	0.00011	0.00001	0.00004	0.00002	0.00006	0.00001	0.02	0.00161	1	0.00002
Marshalling Yards - 2013																																											
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	15	0.00	0.00	0.00011	5.36E-06	0.00004	0.00002	0.00006	0.00001	0.02	0.00161	1	0.00002
Subtotal																																0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.52	0.00
Flagmen																																											
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	15	0.00	0.00	0.00011	5.36E-06	0.00004	0.00002	0.00006	0.00001	0.02	0.00161	1	0.00002
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	15	0.00	0.00	0.00011	5.36E-06	0.00004	0.00002	0.00006	0.00001	0.01608	0.00161	1	0.00002
																																0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	1.03	0.00
Dig Wood Pole Holes																																											
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	27	0.01	0.00	0.00020	9.64E-06	0.00007	0.00004	0.00011	0.00002	0.03	0.00289	1	0.00004
Subtotal																																0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.93	0.00
Dig and Install Anchor Bolt Foundations																																											
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	1	35	80	0.54		1.161		0.1						0.003		0.07		0.008	0.013	0.064		0.002	0.005	350.437		0.005		0.11		16	0.00	0.00	0.00014	4.23E-06	0.00013	0.00010	0.00007	0.00001	0.01715	0.00172	0	0.00001
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	2	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		16	0.00	0.01	0.00046	3.95E-05	0.00062	0.00053	0.01231	0.00258	0.07965	0.00797	4	0.00002
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		16	0.00	0.00	0.00024	7.05E-06	0.00009	0.00006	0.01204	0.00253	0.03983	0.00398	1	0.00001
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		16	0.00	0.00	0.00009	4.23E-06	0.00009	0.00007	0.00007	0.00001	0.01715	0.00172	0	0.00000
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	2	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		16	0.00	0.00	0.00019	8.47E-06	0.00018	0.00013	0.00014	0.00003	0.03431	0.00343	1	0.00001
Subtotal																																0.01	0.03	0.00	0.00	0.00	0.00	0.02	0.01	0.19	0.02	6.95	0.00
Haul Wood and Steel Poles																																											
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		15	0.00	0.01	0.00093	2.25E-05	0.00056	0.00047	0.01128	0.00237	0.04533	0.00453	2	0.00004
Truck, Flatbed, 40'	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		15	0.00	0.00	0.00023	6.61E-06	0.00008	0.00006	0.01128	0.00237	0.03734	0.00373	1	0.00001
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	2	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		15	0.00	0.00	0.00018	7.94E-06	0.00017	0.00012	0.00013	0.00003	0.03216	0.00322	1	0.00001
Subtotal																																0.01	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.11	0.01	4.03	0.00
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		15	0.00	0.00	0.00023	6.61E-06	0.00008	0.00006	0.01128	0.00237	0.03734	0.00373	1	0.00001
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		15	0.00	0.00	0.00009	3.97E-06	0.00009	0.00006	0.00006	0.00001	0.01608	0.00161	0	0.00000
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		15	0.00	0.00	0.00009	3.97E-06	0.00009	0.00006	0.00006	0.00001	0.01608	0.00161	0	0.00000
Subtotal																																0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.01	1.61	0.00
Cleanup at Pole Holes																																											
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		10	0.00	0.00	0.00006	2.65E-06	0.00006	0.00004	0.00004	0.00001	0.01072	0.00107	0	0.00000
Subtotal																																0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.31	0.00
Install New Sub Transmission and Distribution Conductors																																											
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	2	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		10	0.00	0.01	0.00030	8.82E-06	0.00011	0.00008	0.01505	0.00316	0.04978	0.00498	1	0.00001
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		10	0.00	0.00	0.00015	4.41E-06	0.00006	0.00004	0.00752	0.00158	0.02489	0.00249	0	0.00001
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		10	0.00	0.01	0.00062	1.50E-05	0.00037	0.00031	0.00752	0.00158	0.03022	0.00302	2	0.00003
Truck, Lowboy with Reel Stands	Medium Duty Truck, Diesel	3	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		10	0.00	0.01	0.00043	3.70E-05	0.00058	0.00049	0.01154	0.00242	0.07468	0.00747	4	0.00002
Truck, Lowboy	Medium Duty Truck, Diesel	1	35	80	1.424		4.974		0.163						0.014		0.195		0.012	0.013	0.179		0.003	0.005	1505		0.008		0.47		10	0.00	0.00	0.00014	1.23E-05	0.00019	0.00016	0.00385	0.00081	0.02489	0.00249	1	0.00001
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	3	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	10	0.01	0.00	0.00022	1.07E-05	0.00008	0.00005	0.00013	0.00003	0.03216	0.00322	1	0.00005
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	10	0.00	0.00	0.00015	7.14E-06	0.00006	0.00003	0.00008	0.00002	0.02144	0.00214	1	0.00003
Subtotal																																0.02	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.15	0.02	7.03	0.00
Install New Distribution Services																																											
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	3	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		10	0.00	0.00	0.00018	7.94E-06	0.00017	0.00012	0.00013	0.00003	0.03216	0.00322	1	0.00001
Truck, Pick-Up	Light Duty Truck 1, Diesel	3	35	80	0.46		1.196		0.067						0.003		0.044		0.008	0.013	0.04		0.002	0.005	347.049		0.003		0.11		10	0.00	0.00	0.00018	7.94E-06	0.00017	0.00012	0.00013	0.00003	0.03216	0.00322	1	0.00001
Subtotal																																0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	1.84	0.00
Remove Old Wood/Steel Poles																																											
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		76	0.00	0.02	0.00115	3.35E-05	0.00042	0.00029	0.05718	0.01201	0.18918	0.01892	4	0.00005
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		76	0.02	0.07	0.00472	1.14E-04	0.00283	0.00236	0.05718	0.01201	0.22965	0.02296	12	0.00022
Truck, Flatbed, 40'	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		76	0.00	0.02	0.00115	3.35E-05	0.00042	0.00029	0.05718	0.01201	0.18918	0.01892	4	0.00005
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	76	0.01	0.00	0.00057	2.71E-05	0.00021	0.00012	0.00032	0.00007	0.08148	0.00815	3	0.00013
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	76	0.01	0.00	0.00057	2.71E-05	0.00021	0.00012	0.00032	0.00007	0.08148	0.00815	3	0.00013
Subtotal																																0.06	0.12	0.00	0.00	0.00	0.00	0.06	0.01	0.35	0.04	8.76	0.00
Install and Remove Guard Pole Structures																																											
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		5	0.00	0.00	0.00008	2.20E-06	0.00003	0.00002	0.00376	0.00079	0.01245	0.00124	0	0.00000
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.712		3.386		0.171						0.005		0.038		0.012	0.013	0.035		0.003	0.005	526.571		0.008		0.32		5	0.00	0.00	0.00008	2.20E-06	0.00003	0.00002	0.00376	0.00079	0.01245	0.00124	0	0.00000
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.467		10.758		0.705						0.017		0.359		0.036	0.028	0.331		0.009	0.012	1827.808		0.033		1.02		5	0.00	0.00	0.00031	7.50E-06	0.00019	0.00016	0.00376	0.00079	0.01511	0.00151	1	0.00001
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	5	0.00	0.00	0.00004	1.79E-06	0.00001	0.00001	0.00002	0.00000	0.00536	0.00054	0	0.00001
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	2.022	7.863	0.189	0.369	0.035	0.546	0.193	0.025	0.04	0.048	0.004	0.002	0.01	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.961	201.957	0.018	0.031	0.02	0.04	5	0.00	0.00	0.00004	1.79E-06	0.00001	0.00001	0.00002	0.00000	0.00536	0.00054	0	0.00001
Subtotal																																0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.34	0.00
																											Total				0.00	0.12	0.23	0.01	0.00	0.00	0.00	0.13	0.03	1.06	0.11	33.86	0.00

Assume startup after 8 hours

Table A-12
Construction Truck Trip Emissions
230 kV Reconductoring
Barren Ridge Renewable Transmission Project

Construction Phase	Vehicle Class	No. of Trucks per day	Speed	VMT	CO		NO$_x$		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
			(mph)	(mi/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}	Running Exhaust (g/mi)	Start-Up (g/start)^{a}
Construction Inspection - 2014																														
Truck, Pick-Up	Light Duty Truck 1, Catalyst	6	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Subtotal																														
Marshalling Yards - 2014																														
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	1	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Subtotal																														
Survey (Roads, Pads and Structure Location) - 2014																														
Truck, Pick-Up	Light Duty Truck 1, Catalyst	1	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Road Work and Structure Pads - 2014																														
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														
Guard Poles - 2014																														
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.756		4.428		0.196						0.005		0.048		0.012	0.013	0.044		0.003	0.005	531.81		0.009		0.42	
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.756		4.428		0.196						0.005		0.048		0.012	0.013	0.044		0.003	0.005	531.81		0.009		0.42	
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	2	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														
Wreck-Out (Conductors, Structures and Foundations) - 2014																														
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	3	35	80	0.699		3.126		0.163						0.005		0.036		0.012	0.013	0.034		0.003	0.005	525.662		0.008		0.30	
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	3	35	80	0.699		3.126		0.163						0.005		0.036		0.012	0.013	0.034		0.003	0.005	525.662		0.008		0.30	
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	3	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	4	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														
Foundations and Rebar Cages - 2014																														
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	2	35	80	0.534		1.16		0.095						0.003		0.065		0.008	0.013	0.06		0.002	0.005	349.655		0.004		0.11	
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	4	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	2	35	80	0.699		3.126		0.163						0.005		0.036		0.012	0.013	0.034		0.003	0.005	525.662		0.008		0.30	
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Pick-Up	Light Duty Truck 1, Diesel	2	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	3	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014																														
Truck, Flatbed, 2 1/2 Ton	Light Duty Truck 2, Catalyst	2	35	80	2.12	8.281	0.278	0.58	0.04	0.628	0.198	0.026	0.041	0.05	0.004	0.002	0.022	0.032	0.008	0.013	0.02	0.029	0.002	0.005	386.637	202.487	0.021	0.038	0.03	0.06
Truck, Pick-Up	Light Duty Truck 1, Catalyst	2	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	8	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014																														
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	5	35	80	0.699		3.126		0.163						0.005		0.036		0.012	0.013	0.034		0.003	0.005	525.662		0.008		0.30	
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	1	35	80	0.699		3.126		0.163						0.005		0.036		0.012	0.013	0.034		0.003	0.005	525.662		0.008		0.30	
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	2	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	8	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Pick-Up	Light Duty Truck 1, Catalyst	4	35	80	1.892	7.346	0.174	0.341	0.033	0.504	0.196	0.025	0.039	0.047	0.004	0.002	0.011	0.016	0.008	0.013	0.01	0.015	0.002	0.005	384.714	201.622	0.017	0.028	0.02	0.03
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Fuel (Helicopter Support)	Medium Duty Truck, Diesel	1	35	80	1.384		4.48		0.156						0.014		0.185		0.012	0.013	0.188		0.003	0.005	1505		0.008		0.43	
Subtotal																														
Cleanup and Restoration - 2014																														
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	1	35	80	3.08		9.4		0.637						0.017		0.311		0.036	0.028	0.286		0.009	0.012	1827.808		0.03		0.89	
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Truck, Pick-Up	Light Duty Truck 1, Diesel	1	35	80	0.458		1.196		0.067						0.003		0.043		0.008	0.013	0.041		0.002	0.005	346.991		0.003		0.11	
Subtotal																														

Construction Phase	Vehicle Class	Construction Days	Total Emissions, tons												
			CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Construction Inspection - 2014															
Truck, Pick-Up	Light Duty Truck 1, Catalyst	170	0.19	0.02	0.00727	3.64E-04	0.00291	0.00156	0.76736	0.16115	1.09358	0.10936	35	0.00159	0.00156
Subtotal			0.18670	0.01642	0.00727	0.00036	0.00291	0.00156	0.76736	0.16115	1.09358	0.10936	35	0.00159	0.00156
Marshalling Yards - 2014															
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	170	0.05	0.14	0.00955	2.55E-04	0.00562	0.00460	0.12789	0.02686	0.51369	0.05137	27	0.00045	0.01339
Truck, Pick-Up	Light Duty Truck 1, Catalyst	170	0.06	0.01	0.00242	1.21E-04	0.00097	0.00052	0.25579	0.05372	0.36453	0.03645	12	0.00053	0.00052
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	170	0.03	0.00	0.00121	6.07E-05	0.00049	0.00026	0.12789	0.02686	0.18226	0.01823	6	0.00027	0.00026
Subtotal			0.14	0.15	0.01	0.00	0.01	0.01	0.51	0.11	1.06	0.11	44.93	0.00	0.01
Survey (Roads, Pads and Structure Location) - 2014															
Truck, Pick-Up	Light Duty Truck 1, Catalyst	60	0.01	0.00	0.00043	2.14E-05	0.00017	0.00009	0.04514	0.00948	0.06433	0.00643	2	0.00009	0.00009
			0.01098	0.00097	0.00043	0.00002	0.00017	0.00009	0.04514	0.00948	0.06433	0.00643	2	0.00009	0.00009
Road Work and Structure Pads - 2014															
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	60	0.02	0.05	0.00337	8.99E-05	0.00198	0.00162	0.04514	0.00948	0.18130	0.01813	10	0.00016	0.00472
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	60	0.01	0.02	0.00083	7.41E-05	0.00111	0.00104	0.04514	0.00948	0.14935	0.01494	8	0.00004	0.00225
Truck, Pick-Up	Light Duty Truck 1, Diesel	60	0.00	0.01	0.00035	1.59E-05	0.00034	0.00025	0.04514	0.00948	0.06433	0.00643	2	0.00002	0.00060
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	60	0.00	0.01	0.00035	1.59E-05	0.00034	0.00025	0.04514	0.00948	0.06433	0.00643	2	0.00002	0.00060
Subtotal			0.03	0.09	0.00	0.00	0.00	0.00	0.18	0.04	0.46	0.05	21.31	0.00	0.01
Guard Poles - 2014															
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	35	0.00	0.01	0.00060	1.54E-05	0.00023	0.00016	0.02633	0.00553	0.08712	0.00871	2	0.00003	0.00130
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	35	0.00	0.01	0.00060	1.54E-05	0.00023	0.00016	0.02633	0.00553	0.08712	0.00871	2	0.00003	0.00130
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	35	0.01	0.03	0.00197	5.25E-05	0.00116	0.00095	0.02633	0.00553	0.10576	0.01058	6	0.00009	0.00276
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	35	0.00	0.01	0.00041	1.85E-05	0.00040	0.00030	0.05266	0.01106	0.07505	0.00750	2	0.00002	0.00070
Truck, Pick-Up	Light Duty Truck 1, Diesel	35	0.00	0.00	0.00021	9.26E-06	0.00020	0.00015	0.02633	0.00553	0.03752	0.00375	1	0.00001	0.00035
Subtotal			0.02	0.07	0.00	0.00	0.00	0.00	0.16	0.03	0.39	0.04	12.14	0.00	0.01
Wreck-Out (Conductors, Structures and Foundations) - 2014															
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	105	0.02	0.09	0.00453	1.39E-04	0.00169	0.00117	0.23698	0.04977	0.78410	0.07841	15	0.00022	0.00825
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	105	0.02	0.09	0.00453	1.39E-04	0.00169	0.00117	0.23698	0.04977	0.78410	0.07841	15	0.00022	0.00825
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	105	0.09	0.26	0.01769	4.72E-04	0.01042	0.00853	0.23698	0.04977	0.95183	0.09518	51	0.00083	0.02481
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	105	0.01	0.04	0.00144	1.30E-04	0.00194	0.00181	0.07899	0.01659	0.26137	0.02614	14	0.00007	0.00394
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	105	0.08	0.01	0.00299	1.50E-04	0.00120	0.00064	0.31597	0.06635	0.45030	0.04503	14	0.00066	0.00064
Truck, Pick-Up	Light Duty Truck 1, Catalyst	105	0.04	0.00	0.00150	7.50E-05	0.00060	0.00032	0.15799	0.03318	0.22515	0.02251	7	0.00033	0.00032
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	105	0.00	0.01	0.00062	2.78E-05	0.00059	0.00044	0.07899	0.01659	0.11257	0.01126	3	0.00003	0.00105
Subtotal			0.26	0.50	0.03	0.00	0.02	0.01	1.34	0.28	3.57	0.36	118.78	0.00	0.05
Foundations and Rebar Cages - 2014															
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	75	0.01	0.02	0.00126	3.97E-05	0.00114	0.00089	0.11285	0.02370	0.16082	0.01608	5	0.00005	0.00146
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	75	0.04	0.12	0.00413	3.70E-04	0.00556	0.00519	0.22569	0.04740	0.74676	0.07468	40	0.00021	0.01126
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	75	0.01	0.04	0.00216	6.61E-05	0.00081	0.00056	0.11285	0.02370	0.45325	0.04533	7	0.00011	0.00393
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	75	0.02	0.06	0.00421	1.12E-04	0.00248	0.00203	0.05642	0.01185	0.22663	0.02266	12	0.00020	0.00591
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	75	0.01	0.03	0.00103	9.26E-05	0.00139	0.00130	0.05642	0.01185	0.18669	0.01867	10	0.00005	0.00281
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	75	0.00	0.01	0.00044	1.98E-05	0.00042	0.00032	0.05642	0.01185	0.08041	0.00804	2	0.00002	0.00075
Truck, Pick-Up	Light Duty Truck 1, Diesel	75	0.01	0.02	0.00089	3.97E-05	0.00085	0.00063	0.11285	0.02370	0.16082	0.01608	5	0.00004	0.00150
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	75	0.01	0.02	0.00133	5.95E-05	0.00127	0.00095	0.16927	0.03555	0.24123	0.02412	7	0.00006	0.00225
Subtotal			0.10	0.31	0.02	0.00	0.01	0.01	0.90	0.19	2.26	0.23	87.21	0.00	0.03
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014															
Truck, Flatbed, 2 1/2 Ton	Light Duty Truck 2, Catalyst	90	0.04	0.00	0.00147	6.43E-05	0.00070	0.00044	0.13542	0.02844	0.19298	0.01930			
Truck, Pick-Up	Light Duty Truck 1, Catalyst	90	0.03	0.00	0.00128	6.43E-05	0.00051	0.00028	0.13542	0.02844	0.19298	0.01930			
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	90	0.13	0.01	0.00513	2.57E-04	0.00206	0.00110	0.54166	0.11375	0.77194	0.07719			
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	90	0.01	0.04	0.00124	1.11E-04	0.00167	0.00156	0.06771	0.01422	0.22403	0.02240			
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	90	0.00	0.01	0.00053	2.38E-05	0.00051	0.00038	0.06771	0.01422	0.09649	0.00965			
Subtotal			0.22	0.06	0.01	0.00	0.01	0.00	0.95	0.20	1.48	0.15	0.00	0.00	0.00
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014															
Truck, Flatbed with Bucket, 5 Ton	Light Heavy Duty Truck 2, Diesel	90	0.03	0.12	0.00647	1.98E-04	0.00242	0.00167	0.33854	0.07109	1.12014	0.11201	21	0.00032	0.01178
Truck, Flatbed with Boom, 5 Ton	Light Heavy Duty Truck 2, Diesel	90	0.01	0.02	0.00129	3.97E-05	0.00048	0.00033	0.06771	0.01422	0.22403	0.02240	4	0.00006	0.00236
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	90	0.05	0.15	0.01011	2.70E-04	0.00595	0.00487	0.13542	0.02844	0.54390	0.05439	29	0.00048	0.01417
Truck, Water, 2,000-4,000 gal	Medium Duty Truck, Diesel	90	0.01	0.04	0.00124	1.11E-04	0.00167	0.00156	0.06771	0.01422	0.22403	0.02240	12	0.00006	0.00338
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Catalyst	90	0.13	0.01	0.00513	2.57E-04	0.00206	0.00110	0.54166	0.11375	0.77194	0.07719	25	0.00112	0.00110
Truck, Pick-Up	Light Duty Truck 1, Catalyst	90	0.07	0.01	0.00256	1.29E-04	0.00103	0.00055	0.27083	0.05687	0.38597	0.03860	12	0.00056	0.00055
Truck, Mechanics, 1-2 Ton	Light Duty Truck 1, Diesel	90	0.00	0.01	0.00053	2.38E-05	0.00051	0.00038	0.06771	0.01422	0.09649	0.00965	3	0.00002	0.00090
Truck, Fuel (Helicopter Support)	Medium Duty Truck, Diesel	90	0.01	0.04	0.00124	1.11E-04	0.00167	0.00156	0.06771	0.01422	0.22403	0.02240	12	0.00006	0.00338
Subtotal			0.31	0.40	0.03	0.00	0.02	0.01	1.56	0.33	3.59	0.36	117.81	0.00	0.04
Cleanup and Restoration - 2014															
Truck, Semi, Tractor	Heavy Duty Truck, Diesel	85	0.02	0.07	0.00477	1.27E-04	0.00281	0.00230	0.06395	0.01343	0.25684	0.02568	14	0.00022	0.00669
Truck, Crew Cab, Flatbed, 1 Ton	Light Duty Truck 1, Diesel	85	0.00	0.01	0.00050	2.25E-05	0.00048	0.00036	0.06395	0.01343	0.09113	0.00911	3	0.00002	0.00085
Truck, Pick-Up	Light Duty Truck 1, Diesel	85	0.00	0.01	0.00050	2.25E-05	0.00048	0.00036	0.06395	0.01343	0.09113	0.00911	3	0.00002	0.00085
Subtotal			0.03	0.09	0.01	0.00	0.00	0.00	0.19	0.04	0.44	0.04	18.90	0.00	0.01
			1.29	1.68	0.12	0.00	0.07	0.06	6.61	1.39	14.40	1.44	458.19	0.01	0.15

Assume startup after 8 hours
Assume 45 minutes run time total
2009 Emission Factors from EMFAC2007,
average temp 60F; South Coast Air Basin

Paved Road Fugitive Dust
EPA's AP-42, Section 13.2.1, November 2006
E = k(sL/2)^0.65 x (W/3)^1.5 - C
For heavy-duty trucks assume 20 tons/vehicle
Assume silt loading for 10,000 ADT roadways = 0.03 g/m3
Assume k = 0.016 PM10
Assume 6 miles in addition for track-out for PM10
Emission Factors

PM10	0.017495628

Unpaved Road Fugitive Dust
EPA's AP-42, Section 13.2.2
Industrial Roads
E = k (s/12)^a x (W/3)^b
For LDT assume 2 tons/vehicle, MDT assume 13 tons/vehicle, HDT assume 20 tons/vehicle
k = 1.5 for PM10, 0.15 for PM2.5
s = 8.5, a = 0.9, b = 0.45
Assume 61% control efficiency for watering 3x daily
Emission Factors

PM10, LDT	0.357378738
PM10, MDT	0.829735596
PM10, HDT	1.007230136
PM2.5, LDT	0.035737874
PM2.5, MDT	0.08297356
PM2.5, HDT	0.100723014

Assume 6 miles each way of unpaved road travel

Table A-13
Helicopter Emission Factors
Barren Ridge Renewable Transmission Project

Helicopter Emission Calculations

Emission Factor Derivation

Approach/Climbout (i.e. Working)

Equiv. Engs	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
T53-L-11D	1100	1	0.20	2.04	5.00	0.04	0.27			
T58-GE-5 (2)	1500	2	1.40	9.92	12.79	0.11	0.71			

Note: SOx increased to assume 30 ppm sulfur Jet A fuel Sulfur Content

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
T53-L-11D	1100	1	9.00	4.21	0.20	0.01	0.01			
T58-GE-5 (2)	1500	2	25.86	45.12	0.40	0.02	0.03			

Source: FAEED database
FAEED - FAA Aircraft Engine Emission Database

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.2877	0.022724	0.026086
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.114	0.045827	0.052607
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.385	0.144841	0.166268
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.6	0.465559	0.534432

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.8592	0.004752	0.005455
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.5495	0.009583	0.011001
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.3914	0.021804	0.02503
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.186	0.070084	0.080452

Construction
Assumptions:
Idle time is 10% of working time for small helicopters and negligible for the Heavy Lift.
Assumes helicopters stay within 3000 feet of the ground.
Applicant Measure APM-G7 notes use of helicopters assisted construction in sensitive areas, but that APM is not assumed to be implemented in this emission estimate.

Fuel Use							Emission Indices		
Assume density of fuel is 6.76 lbs/gallon							lbs/1000 lbs/ fuel		
	Working	Idle	Working	Idle			CO2	CH4	N2O
	kg/sec	kg/sec	gallons/hr	gallons/hr			3117	0.0872	0.1001
Hughes 500	0.03268364	0.006835	38.55018	8.061311					
Light Lift	0.065912	0.013783	77.74286	16.25698					
Medium Lift	0.20832	0.03136	245.7124	36.98896					
Heavy Lift	0.6696	0.1008	789.7897	118.8931					

Table A-14
Helicopter Operational Assumptions
Barren Ridge Renewable Transmission Project

Helicopter Emission Calculations

Helicopter Construction
Assumptions:
1) Hughes 500 size helicopters are used during conductor installation for the proposed project, and two Hughes helicopters are in operation during line stringing for 2.5 hours/day each.
2) Use of Light Lift, Medium Lift, and Heavy Lift helicopters for helicopter tower site construction and wreckout are based on estimates provided by Power Engineers
3) Idle time is 10% of working time for Hughes 500, Light Lift, and Medium Lift helicopters and negligible for the Heavy Lift.
4) Assumes helicopters stay within 3000 feet of the ground.
5) Assumes new construction is characterized by "Construction" activities below.
6) Assumes reconductoring includes the following: Conductor Removal, Conductor and OHGW Installation

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6

Table A-14
Helicopter Operational Assumptions
Barren Ridge Renewable Transmission Project

New Construction	Hughes 500		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	30	78	0	1	0	0

New Construction - Mitigation	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total Number of Trips per Tower Site	112	194	68	265	16	24

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500	2.50	0.250
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-15
Maximum Daily Helicopter Emissions
Helicopter Mitigation
Barren Ridge Renewable Transmission Project

# tower/day	SCAQMD	AVAQMD	SCAQMD
Construction	Alternative 1	Alternative 2A	Alternative 2A
Light Lift	1	1	1
Medium Lift	1	1	1
Heavy Lift	1	1	1

# trip/day	SCAQMD	AVAQMD	SCAQMD
Construction	Alternative 1	Alternative 2A	Alternative 2A
Light Lift	112	112	112
Medium Lift	68	68	68
Heavy Lift	16	16	16

Alternative 1 - SCAQMD

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	1	0	1	0	1	0
Total Number of Trips	112	0	68	0	16	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Light Lift		112
Medium Lift		68
Heavy Lift		16

230 kV	Suspension	196
	Dead End	0

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Light Lift			37.33	3.73
Medium Lift			22.67	2.27
Heavy Lift			5.33	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	31.55	70.68	144.32	1.20	7.85	62435.09	1.75	2.01
Medium Lift	168.65	610.65	542.85	4.57	30.09	119120.69	3.33	3.83
Heavy Lift	44.78	317.45	409.28	3.40	22.67	88755.18	2.48	2.85

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	0.02	0.04	0.07	0.00	0.00	31.22	0.00	0.00
Medium Lift	0.08	0.31	0.27	0.00	0.02	59.56	0.00	0.00
Heavy Lift	0.02	0.16	0.20	0.00	0.01	44.38	0.00	0.00

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
	0.12	0.50	0.55	0.00	0.03	135.16	0.00	0.00

Alternative 2A

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	1	0	1	0	1	0
Total Number of Trips	112	0	68	0	16	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Light Lift		112
Medium Lift		68
Heavy Lift		16

230 kV	Suspension	196
	Dead End	0

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Light Lift			37.33	3.73
Medium Lift			22.67	2.27
Heavy Lift			5.33	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	31.55	70.68	144.32	1.20	7.85	62435.09	1.75	2.01
Medium Lift	168.65	610.65	542.85	4.57	30.09	119120.69	3.33	3.83
Heavy Lift	44.78	317.45	409.28	3.40	22.67	88755.18	2.48	2.85

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
Light Lift	0.02	0.04	0.07	0.00	0.00	31.22	0.00	0.00
Medium Lift	0.08	0.31	0.27	0.00	0.02	59.56	0.00	0.00
Heavy Lift	0.02	0.16	0.20	0.00	0.01	44.38	0.00	0.00

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO_2	CH_4	N_2O
	0.12	0.50	0.55	0.00	0.03	135.16	0.00	0.00

Table A-30
Construction Emissions - Segment G
Reconductoring
Barren Ridge Renewable Transmission Project

		Emissions, tons/year					
		ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
Segment							
Construction Trucks		0.00	0.02	0.01	0.00	0.20	0.03
		0.08	**1.25**	**0.27**	**0.00**	**0.71**	**0.08**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.01	0.05	0.11	0.00	0.00	0.00
Worker Trips		0.00	0.04	0.00	0.00	0.22	0.02
Construction Trucks		0.00	0.03	0.03	0.00	0.43	0.06
Helicopter Emissions		2.51	8.25	10.98	0.09	0.60	0.60
		2.53	**8.37**	**11.12**	**0.09**	**1.25**	**0.68**
Cleanup and Restoration - 2014							
Heavy Construction Equipment		0.01	0.05	0.06	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.01	**0.06**	**0.07**	**0.00**	**0.09**	**0.01**
Total Segment G - SCAQMD	Max Daily	**5.22**	**18.62**	**23.11**	**0.19**	**6.42**	**2.25**
Total Segment G - BLM	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment G - USFS AVAQMD	**2.2**	0.87	3.38	3.92	0.03	1.65	0.44
Total Segment G - USFS SCAQMD	**12.99**	4.65	16.56	20.56	0.16	5.71	2.00

Table A-16
Annual Helicopter Emissions
Helicopter Mitigation
Barren Ridge Renewable Transmission Project

Alternative 1 (SCAQMD)

230kV Construction	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total	112	194	68	265	16	24
Number of Tower Site	48	2	48	2	48	2
Total Number of Trips	5376	388	3264	530	768	48

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	48	2	48	2	48	2
Total Number of Trips	5376	388	3264	530	768	48

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		5764
Medium Lift		3794
Heavy Lift		816

230 kV	Suspension	9408
	Dead End	966

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			1921.33	192.13
Medium Lift			1264.67	126.47
Heavy Lift			272.00	0.00

Relating Factors to Potential Construction/Operating Helicopters - (Copy&pasted from helicopter emissions tab)

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1623.58	3637.40	7427.12	61.58	404.14	3213177.45	89.89	2.11
Medium Lift	9409.60	34070.53	30287.92	254.73	1679.06	6646233.77	185.93	3.17
Heavy Lift	2283.92	16189.80	20873.27	173.49	1156.41	4526514.10	126.63	0.00

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1623.58	3637.40	7427.12	61.58	404.14	3213177.45	89.89	103.19
Medium Lift	9409.60	34070.53	30287.92	254.73	1679.06	6646233.77	185.93	213.44
Heavy Lift	2283.92	16189.80	20873.27	173.49	1156.41	4526514.10	126.63	145.37

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.81	1.82	3.71	0.03	0.20	1606.59	0.04	0.05
Medium Lift	4.70	17.04	15.14	0.13	0.84	3323.12	0.09	0.11
Heavy Lift	1.14	8.09	10.44	0.09	0.58	2263.26	0.06	0.07

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	6.66	26.95	29.29	0.24	1.62	7192.96	0.20	0.23

Alternative 2A - AVAQMD

230kV Construction	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total	112	194	68	265	16	24
Number of Tower Site	7	0	7	0	7	0
Total Number of Trips	784	0	476	0	112	0

Table A-16
Annual Helicopter Emissions
Helicopter Mitigation
Barren Ridge Renewable Transmission Project

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	22	2	22	2	22	2
Total Number of Trips	2464	388	1496	530	352	48

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		784
Medium Lift		476
Heavy Lift		112

230 kV	Suspension	4312
	Dead End	966

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			261.33	26.13
Medium Lift			158.67	15.87
Heavy Lift			37.33	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	220.83	494.75	1010.21	8.38	54.97	437045.65	12.23	14.04
Medium Lift	1180.54	4274.53	3799.96	31.96	210.66	833844.83	23.33	26.78
Heavy Lift	313.48	2222.13	2864.96	23.81	158.72	621286.25	17.38	19.95

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	220.83	494.75	1010.21	8.38	54.97	437045.65	12.23	14.04
Medium Lift	1180.54	4274.53	3799.96	31.96	210.66	833844.83	23.33	26.78
Heavy Lift	313.48	2222.13	2864.96	23.81	158.72	621286.25	17.38	19.95

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.11	0.25	0.51	0.00	0.03	218.52	0.01	0.01
Medium Lift	0.59	2.14	1.90	0.02	0.11	416.92	0.01	0.01
Heavy Lift	0.16	1.11	1.43	0.01	0.08	310.64	0.01	0.01

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
0.86	3.50	3.84	0.03	0.21	946.09	0.03	0.03

Alternative 2A - SCAQMD

230kV Construction	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total	112	194	68	265	16	24
Number of Tower Site	15	0	15	0	15	0
Total Number of Trips	1680	0	1020	0	240	0

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	22	2	22	2	22	2
Total Number of Trips	2464	388	1496	530	352	48

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		1680
Medium Lift		1020
Heavy Lift		240

230 kV	Suspension	4312
	Dead End	966

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			560.00	56.00
Medium Lift			340.00	34.00
Heavy Lift			80.00	0.00

Table A-16
Annual Helicopter Emissions
Helicopter Mitigation
Barren Ridge Renewable Transmission Project

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	473.22	1060.17	2164.74	17.95	117.79	936526.39	26.20	30.08
Medium Lift	2529.73	9159.71	8142.77	68.48	451.41	1786810.35	49.99	57.38
Heavy Lift	671.74	4761.70	6139.20	51.03	340.12	1331327.68	37.24	42.75

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	473.22	1060.17	2164.74	17.95	117.79	936526.39	26.20	30.08
Medium Lift	2529.73	9159.71	8142.77	68.48	451.41	1786810.35	49.99	57.38
Heavy Lift	671.74	4761.70	6139.20	51.03	340.12	1331327.68	37.24	42.75

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.24	0.53	1.08	0.01	0.06	468.26	0.01	0.02
Medium Lift	1.26	4.58	4.07	0.03	0.23	893.41	0.02	0.03
Heavy Lift	0.34	2.38	3.07	0.03	0.17	665.66	0.02	0.02

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	1.84	7.49	8.22	0.07	0.45	2027.33	0.06	0.07

Segment H - AVAQMD

230kV Construction	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total	112	194	68	265	16	24
Number of Tower Site	26	2	26	2	26	2
Total Number of Trips	2912	388	1768	530	416	48

T 36
Annual He Emissions
Helicop igation
Barren Ridge Renewable Transmission Project

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	22	2	22	2	22	2
Total Number of Trips	2464	388	1496	530	352	48

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		3300
Medium Lift		2298
Heavy Lift		464

230 kV	Suspension	4312
	Dead End	966

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			1100.00	110.00
Medium Lift			766.00	76.60
Heavy Lift			154.67	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	929.53	2082.48	4252.17	35.25	231.38	1839605.41	51.46	59.08
Medium Lift	5699.33	20636.29	18345.19	154.29	1017.00	4025578.60	112.62	129.28
Heavy Lift	1298.70	9205.96	11869.12	98.65	657.57	2573900.17	72.01	82.66

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	929.53	2082.48	4252.17	35.25	231.38	1839605.41	51.46	59.08
Medium Lift	5699.33	20636.29	18345.19	154.29	1017.00	4025578.60	112.62	129.28
Heavy Lift	1298.70	9205.96	11869.12	98.65	657.57	2573900.17	72.01	82.66

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.46	1.04	2.13	0.02	0.12	919.80	0.03	0.03
Medium Lift	2.85	10.32	9.17	0.08	0.51	2012.79	0.06	0.06
Heavy Lift	0.65	4.60	5.93	0.05	0.33	1286.95	0.04	0.04

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	3.96	15.96	17.23	0.14	0.95	4219.54	0.12	0.14

Table A-16
Annual Helicopter Emissions
Helicopter Mitigation
Barren Ridge Renewable Transmission Project

Segment H - SCAQMD

230kV Construction	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	2	2	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total	112	194	68	265	16	24
Number of Tower Site	73	2	73	2	73	2
Total Number of Trips	8176	388	4964	530	1168	48

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	112	194	68	265	16	24
Number of Tower Site	22	2	22	2	22	2
Total Number of Trips	2464	388	1496	530	352	48

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		8564
Medium Lift		5494
Heavy Lift		1216

230 kV	Suspension	4312
	Dead End	966

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			2854.67	285.47
Medium Lift			1831.33	183.13
Heavy Lift			405.33	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2		
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2412.27	5404.36	11035.02	91.49	600.46	4774054.77	133.56	153.32
Medium Lift	13625.81	49336.72	43859.20	368.88	2431.41	9624251.02	269.24	309.08
Heavy Lift	3403.49	24125.97	31105.27	258.54	1723.28	6745393.56	188.71	216.62

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2412.27	5404.36	11035.02	91.49	600.46	4774054.77	133.56	153.32
Medium Lift	13625.81	49336.72	43859.20	368.88	2431.41	9624251.02	269.24	309.08
Heavy Lift	3403.49	24125.97	31105.27	258.54	1723.28	6745393.56	188.71	216.62

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1.21	2.70	5.52	0.05	0.30	2387.03	0.07	0.08
Medium Lift	6.81	24.67	21.93	0.18	1.22	4812.13	0.13	0.15
Heavy Lift	1.70	12.06	15.55	0.13	0.86	3372.70	0.09	0.11

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	9.72	39.43	43.00	0.36	2.38	10571.85	0.30	0.34

Table A-17
Maximum Daily Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Segment G

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	1	0	1	0	1	0
Total Number of Trips	109	0	12	0	2	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Light Lift		109
Medium Lift		12
Heavy Lift		2

230 kV	Suspension	123
	Dead End	0

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Light Lift			36.33	3.63
Medium Lift			4.00	0.40
Heavy Lift			0.67	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Light Lift	847	1	6.933220627	3.237982495	0.154241734	0.006564567	0.01093913	169.86	0.00	0.01
Medium Lift	1400	2	48.28053105	84.22585683	0.746683128	0.029872282	0.049778875	342.55	0.01	0.01
Heavy Lift	4500	2	155.1874212	270.7259684	2.400052911	0.096018048	0.160003527	779.39	0.02	0.03

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Light Lift	30.70	68.79	140.45	1.16	7.64	60135.28	1.68	1.93
Medium Lift	29.76	107.76	95.80	0.81	5.31	20846.56	0.58	0.67
Heavy Lift	5.60	39.68	51.16	0.43	2.83	11094.40	0.31	0.36

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Light Lift	0.02	0.03	0.07	0.00	0.00	55.00	0.00	0.00
Medium Lift	0.01	0.05	0.05	0.00	0.00	2048.42	0.06	0.07
Heavy Lift	0.00	0.02	0.03	0.00	0.00	21.21	0.00	0.00

Total Emissions (ton)

	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	0.03	0.11	0.14	0.00	0.01	2124.62	0.06	0.07

T 8
Annual H Emissions
Rec oring
Barren Ridge Renewable Transmission Project

Segment A - KCAPCD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	66	2	66	2	66	2
Total Number of Trips	7194	330	792	30	132	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	66	2	66	2	66	2
Total Number of Trips	7194	330	792	30	132	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		7524
Medium Lift		822
Heavy Lift		144

230 kV	Suspension	8118
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			2508.00	250.80
Medium Lift			274.00	27.40
Heavy Lift			48.00	0.00

Relating Factors to Potential Construction/Operating Helicopters - (Copy&pasted from helicopter emissions tab)

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2119.33	4748.06	9694.94	80.38	527.54	4194300.34	117.34	134.70
Medium Lift	2038.66	7381.65	6562.12	55.19	363.78	1439958.93	40.28	46.24
Heavy Lift	403.04	2857.02	3683.52	30.62	204.07	798796.61	22.35	25.65

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2119.33	4748.06	9694.94	80.38	527.54	4194300.34	117.34	134.70
Medium Lift	2038.66	7381.65	6562.12	55.19	363.78	1439958.93	40.28	46.24
Heavy Lift	403.04	2857.02	3683.52	30.62	204.07	798796.61	22.35	25.65

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1.06	2.37	4.85	0.04	0.26	2097.15	0.06	0.07
Medium Lift	1.02	3.69	3.28	0.03	0.18	719.98	0.02	0.02
Heavy Lift	0.20	1.43	1.84	0.02	0.10	399.40	0.01	0.01

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
2.08	6.06	8.13	0.07	0.45	2817.13	0.08	0.09

Segment B - KCAPCD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	102	2	102	2	102	2
Total Number of Trips	11118	330	1224	30	204	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	102	2	102	2	102	2
Total Number of Trips	11118	330	1224	30	204	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		11448
Medium Lift		1254
Heavy Lift		216

230 kV	Suspension	12546
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			3816.00	381.60
Medium Lift			418.00	41.80
Heavy Lift			72.00	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	3224.63	7224.32	14751.16	122.30	802.67	6381758.41	178.53	204.95
Medium Lift	3110.08	11261.06	10010.82	84.20	554.97	2196725.66	61.45	0.00
Heavy Lift	604.57	4285.53	5525.28	45.92	306.11	1198194.91	33.52	0.00

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	3224.63	7224.32	14751.16	122.30	802.67	6381758.41	178.53	204.95
Medium Lift	3110.08	11261.06	10010.82	84.20	554.97	2196725.66	61.45	0.00
Heavy Lift	604.57	4285.53	5525.28	45.92	306.11	1198194.91	33.52	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1.61	3.61	7.38	0.06	0.40	3190.88	0.09	0.10
Medium Lift	1.56	5.63	5.01	0.04	0.28	1098.36	0.03	0.00
Heavy Lift	0.30	2.14	2.76	0.02	0.15	599.10	0.02	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
3.47	11.39	15.14	0.13	0.83	4888.34	0.14	0.10

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Annual H [illegible] Emissions
Rec [illegible] oring
Barren Ridge Renewable Transmission Project

Segment B - AVAQMD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	31	2	31	2	31	2
Total Number of Trips	3379	330	372	30	62	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	31	2	31	2	31	2
Total Number of Trips	3379	330	372	30	62	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		3709
Medium Lift		402
Heavy Lift		74

230 kV	Suspension	3813
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			1236.33	123.63
Medium Lift			134.00	13.40
Heavy Lift			24.67	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	847	1	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	847	1	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1044.74	2340.58	4779.18	39.62	260.05	2067604.99	57.84	66.40
Medium Lift	997.01	3610.00	3209.21	26.99	177.91	704213.49	19.70	22.62
Heavy Lift	207.12	1468.19	1892.92	15.73	104.87	410492.70	11.48	13.18

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1044.74	2340.58	4779.18	39.62	260.05	2067604.99	57.84	0.00
Medium Lift	997.01	3610.00	3209.21	26.99	177.91	704213.49	19.70	0.00
Heavy Lift	207.12	1468.19	1892.92	15.73	104.87	410492.70	11.48	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.52	1.17	2.39	0.02	0.13	1033.80	0.03	0.00
Medium Lift	0.50	1.81	1.60	0.01	0.09	352.11	0.01	0.00
Heavy Lift	0.10	0.73	0.95	0.01	0.05	205.25	0.01	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
1.12	3.71	4.94	0.04	0.27	1385.91	0.04	0.00

Segment G - AVAQMD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	31	2	31	2	31	2
Total Number of Trips	3379	330	372	30	62	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	31	2	31	2	31	2
Total Number of Trips	3379	330	372	30	62	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		3709
Medium Lift		402
Heavy Lift		74

230 kV	Suspension	3813
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			1236.33	123.63
Medium Lift			134.00	13.40
Heavy Lift			24.67	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.075225901	0.778198974	1.909181483	0.015566562	0.103759863	812.29	0.02	0.03
Light Lift	847	1	0.151705567	1.569367931	3.850182658	0.031392567	0.209249058	1638.11	0.05	0.05
Medium Lift	1400	2	2.612324258	18.51774157	23.87465967	0.198437299	1.322695827	5177.39	0.14	0.17
Heavy Lift	4500	2	8.396756542	59.5213122	76.73997751	0.637834176	4.2515223	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.437960641	1.605611155	0.076483504	0.003255157	0.005424362	169.86	0.00	0.01
Light Lift	847	1	6.933220627	3.237982495	0.154241734	0.006564567	0.01093913	342.55	0.01	0.01
Medium Lift	1400	2	48.28053105	84.22585683	0.746683128	0.029872282	0.049778875	779.39	0.02	0.03
Heavy Lift	4500	2	155.1874212	270.7259684	2.400052911	0.096018048	0.160003527	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1044.74	2340.58	4779.18	39.62	260.05	2067604.99	57.84	66.40
Medium Lift	997.01	3610.00	3209.21	26.99	177.91	704213.49	19.70	22.62
Heavy Lift	207.12	1468.19	1892.92	15.73	104.87	410492.70	11.48	13.18

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1044.74	2340.58	4779.18	39.62	260.05	2067604.99	57.84	0.00
Medium Lift	997.01	3610.00	3209.21	26.99	177.91	704213.49	19.70	0.00
Heavy Lift	207.12	1468.19	1892.92	15.73	104.87	410492.70	11.48	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	0.52	1.17	2.39	0.02	0.13	1033.80	0.03	0.00
Medium Lift	0.50	1.81	1.60	0.01	0.09	352.11	0.01	0.00
Heavy Lift	0.10	0.73	0.95	0.01	0.05	205.25	0.01	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
1.12	3.71	4.94	0.04	0.27	1385.91	0.04	0.00

Segment G - SCAQMD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	73	2	73	2	73	2
Total Number of Trips	7957	330	876	30	146	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	73	2	73	2	73	2
Total Number of Trips	7957	330	876	30	146	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		8287
Medium Lift		906
Heavy Lift		158

230 kV	Suspension	8979
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			2762.33	276.23
Medium Lift			302.00	30.20
Heavy Lift			52.67	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	0.075225901	0.778198974	1.909181483	0.015566562	0.103759863	812.29	0.02	0.03
Light Lift	847	1	0.151705567	1.569367931	3.850182658	0.031392567	0.209249058	1638.11	0.05	0.05
Medium Lift	1400	2	2.612324258	18.51774157	23.87465967	0.198437299	1.322695827	5177.39	0.14	0.17
Heavy Lift	4500	2	8.396756542	59.5213122	76.73997751	0.637834176	4.2515223	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	1	3.437960641	1.605611155	0.076483504	0.003255157	0.005424362	169.86	0.00	0.01
Light Lift	847	1	6.933220627	3.237982495	0.154241734	0.006564567	0.01093913	342.55	0.01	0.01
Medium Lift	1400	2	48.28053105	84.22585683	0.746683128	0.029872282	0.049778875	779.39	0.02	0.03
Heavy Lift	4500	2	155.1874212	270.7259684	2.400052911	0.096018048	0.160003527	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2334.25	5229.56	10678.09	88.53	581.04	4619639.41	129.24	148.36
Medium Lift	2246.99	8135.98	7232.70	60.83	400.96	1587108.01	44.40	50.97
Heavy Lift	442.23	3134.79	4041.64	33.59	223.91	876457.39	24.52	28.15

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2334.25	5229.56	10678.09	88.53	581.04	4619639.41	129.24	0.00
Medium Lift	2246.99	8135.98	7232.70	60.83	400.96	1587108.01	44.40	0.00
Heavy Lift	442.23	3134.79	4041.64	33.59	223.91	876457.39	24.52	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1.17	2.61	5.34	0.04	0.29	2309.82	0.06	0.00
Medium Lift	1.12	4.07	3.62	0.03	0.20	793.55	0.02	0.00
Heavy Lift	0.22	1.57	2.02	0.02	0.11	438.23	0.01	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
2.51	8.25	10.98	0.09	0.60	3103.37	0.09	0.00

Segment K - SCAQMD

Reconductoring	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0.5	0.5	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	1	1	0	0
Equipment (Air Compressor)	1	1	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	2	6
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	1	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Total Number of Trips per Tower Site	109	165	12	15	2	6
Number of Tower Site	77	2	77	2	77	2
Total Number of Trips	8393	330	924	30	154	12

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	109	165	12	15	2	6
Number of Tower Site	77	2	77	2	77	2
Total Number of Trips	8393	330	924	30	154	12

Summary of Total Number of Helicopter Trips for Entire Tower Sites

		230 kV Construction
Hughes 500		
Light Lift		8723
Medium Lift		954
Heavy Lift		166

230 kV	Suspension	9471
	Dead End	372

Assumptions in time period	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Light Lift	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Table A-18
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500				
Light Lift			2907.67	290.77
Medium Lift			318.00	31.80
Heavy Lift			55.33	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	0	0	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Light Lift	0	0	0.15	1.57	3.85	0.03	0.21	1638.11	0.05	0.05
Medium Lift	0	0	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	0	0	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	0	0	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01
Light Lift	0	0	6.93	3.24	0.15	0.01	0.01	342.55	0.01	0.01
Medium Lift	0	0	48.28	84.23	0.75	0.03	0.05	779.39	0.02	0.03
Heavy Lift	0	0	155.19	270.73	2.40	0.10	0.16	2505.19	0.07	0.08

230kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2457.06	5504.70	11239.90	93.19	611.61	4862690.30	136.04	156.16
Medium Lift	2366.04	8567.02	7615.89	64.05	422.20	1671193.21	46.75	53.67
Heavy Lift	464.62	3293.51	4246.28	35.29	235.25	920834.98	25.76	29.57

Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	2457.06	5504.70	11239.90	93.19	611.61	4862690.30	136.04	0.00
Medium Lift	2366.04	8567.02	7615.89	64.05	422.20	1671193.21	46.75	0.00
Heavy Lift	464.62	3293.51	4246.28	35.29	235.25	920834.98	25.76	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500								
Light Lift	1.23	2.75	5.62	0.05	0.31	2431.35	0.07	0.00
Medium Lift	1.18	4.28	3.81	0.03	0.21	835.60	0.02	0.00
Heavy Lift	0.23	1.65	2.12	0.02	0.12	460.42	0.01	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM	CO2	CH4	N2O
2.64	8.68	11.55	0.10	0.63	3266.94	0.09	0.00

T 9
Maximum Dai ter Emissions
New C uction
Barren Ridge Renewable Transmission Project

# tower/day

Construction	KCAPCD Segment A	KCAPCD Segment B	AVAQMD Segment B	AVAQMD Segment G	SCAQMD Segment G
Hughes 500	1	1	1	1	1
Medium Lift	1	1	1	1	1
Heavy Lift	1	1	1	1	1

# trip/day

Construction	KCAPCD Segment A	KCAPCD Segment B	AVAQMD Segment B	AVAQMD Segment G	SCAQMD Segment G
Hughes 500	108	108	108	0	0
Medium Lift	1	1	1	0	230 kV
Heavy Lift	0	0	0	0	0

Segment A - KCAPCD

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	30	78	0	1	0	0
Number of Tower Site	1	1	1	1	1	1
Total Number of Trips	30	78	0	1	0	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Hughes 500		108
Medium Lift		1
Heavy Lift		0

230 kV	Suspension	30
	Dead End	79

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500			36.00	3.60
Medium Lift			0.33	0.03
Heavy Lift			0.00	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	2	0.15	1.56	3.82	0.03	0.21
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25

Idle	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	2	6.88	3.21	0.15	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	30.17	67.59	138.01	1.14	7.51
Medium Lift	2.48	8.98	7.98	0.07	0.44
Heavy Lift	0.00	0.00	0.00	0.00	0.00

Table A-19
Maximum Daily Helicopter Emissions
New Construction
Barren Ridge Renewable Transmission Project

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	0.02	0.03	0.07	0.00	0.00
Medium Lift	0.00	0.00	0.00	0.00	0.00
Heavy Lift	0.00	0.00	0.00	0.00	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM
0.02	0.04	0.07	0.00	0.00

Segment B

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	30	78	0	1	0	0
Number of Tower Site	1	1	1	1	1	0
Total Number of Trips	30	78	0	1	0	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Hughes 500		108
Medium Lift		1
Heavy Lift		0

230 kV	Suspension	30
	Dead End	79

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500			36.00	3.60
Medium Lift			0.33	0.03
Heavy Lift			0.00	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	2	0.15	1.56	3.82	0.03	0.21
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25

Idle	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	2	6.88	3.21	0.15	0.01	0.01
Medium Lift	1400	2	48.28	84.23	0.75	0.03	0.05
Heavy Lift	4500	2	155.19	270.73	2.40	0.10	0.16

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	30.17	67.59	138.01	1.14	7.51
Medium Lift	2.48	8.98	7.98	0.07	0.44
Heavy Lift	0.00	0.00	0.00	0.00	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	0.02	0.03	0.07	0.00	0.00
Medium Lift	0.00	0.00	0.00	0.00	0.00
Heavy Lift	0.00	0.00	0.00	0.00	0.00

Total Emissions (ton)

HC	CO	NOx	SOx	PM
0.02	0.04	0.07	0.00	0.00

T 9
Maximum Dai ter Emissions
New C uction
Barren Ridge Renewable Transmission Project

Segment G

	Light Lift		Medium Lift		Heavy Lift	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
230 kV Construction						
Total	30	78	0	1	0	0
Number of Tower Site	1	1	1	1	1	1
Total Number of Trips	30	78	0	1	0	0

Summary of Total Number of Helicopter Trips

		230 kV Construction
Hughes 500		108
Medium Lift		1
Heavy Lift		0

230 kV	Suspension	30
	Dead End	79

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500	0.33	0.033
Medium Lift	0.33	0.033
Heavy Lift	0.33	0.000

Total Time for Helicopter Operations (Hour)

Helicopter Type			230 kV Construction	
			Total Working Hours	Total Idle Hours
Hughes 500			36.00	3.60
Medium Lift			0.33	0.03
Heavy Lift			0.00	0.00

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	2	0.15	1.56	3.82	0.03	0.21	1624.58	0.05	0.05
Medium Lift	1400	2	2.61	18.52	23.87	0.20	1.32	5177.39	0.14	0.17
Heavy Lift	4500	2	8.40	59.52	76.74	0.64	4.25	16641.60	0.47	0.53

Idle	Engine HP	Number	Emissions lbs/hour							
			HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	420	2	6.88	3.21	0.15	0.01	0.01	339.72	0.01	0.01
Medium Lift	1400	2	48.28053105	84.22585683	0.746683128	0.029872282	0.049778875	342.55	0.01	0.01
Heavy Lift	4500	2	155.1874212	270.7259684	2.400052911	0.096018048	0.160003527	779.39	0.02	0.03

230 kV Construction - Total Emissions (lbs)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	30.17	67.59	138.01	1.14	7.51	59707.70	1.67	1.92
Medium Lift	2.48	8.98	7.98	0.07	0.44	1737.21	0.05	0.06
Heavy Lift	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Hughes 500	0.02	0.03	0.07	0.00	0.00	54.52	0.00	0.00
Medium Lift	0.00	0.00	0.00	0.00	0.00	2037.06	0.06	0.07
Heavy Lift	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Total Emissions (ton)	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
	0.02	0.04	0.07	0.00	0.00	2091.58	0.06	0.07

Table A-20
Annual Helicopter Emissions
Reconductoring
Barren Ridge Renewable Transmission Project

# towers	KCAPCD	KCAPCD	AVAQMD	KCAPCD	KCAPCD	AVAQMD	SCAQMD			AVAQMD	SCAQMD	AVAQMD	AVAQMD	SCAQMD	AVAQMD	SCAQMD	AVAQMD	SCAQMD	SCAQMD
Construction	Segment A	Segment B	Segment B	Segment C	Segment D	Segment D	Segment D			Segment E	Segment E	Segment F	Segment G	Segment G	Segment H	Segment H	Segment I	Segment I	Segment J
Miles Per Air District	13.25	20.3	6.2	21.68	12.53	13.2	22.27			5.03	7.25	3.6	6.2	14.6	5.2	14.57	17.71	14.15	11.97
Towers	66	102	31	108	63	66	111			25	36	18	31	73	26	73	89	71	60

Helicopter-Hughes500 Emissions

Total Time for Helicopter Operations (Hour)

	Helicopter Type	Total Working Hours	Total Idle Hours
Segment A - KCAPCD	Hughes 500	132.5	13.25
Segment B - KCAPCD	Hughes 500	203	20.3
Segment B - AVAQMD	Hughes 500	62	6.2
Segment C - AVAQMD	Hughes 500	216.8	21.68
Segment D - KCAPCD	Hughes 500	125.3	12.53
Segment D - AVAQMD	Hughes 500	132	13.2
Segment D - SCAQMD	Hughes 500	222.7	22.27
Segment E - AVAQMD	Hughes 500	50.3	5.03
Segment E - SCAQMD	Hughes 500	72.5	7.25
Segment F - AVAQMD	Hughes 500	36	3.6
Segment G - AVAQMD	Hughes 500	62	6.2
Segment G - SCAQMD	Hughes 500	146	14.6
Segment H - AVAQMD	Hughes 500	52	5.2
Segment H - SCAQMD	Hughes 500	145.7	14.57
Segment I - AVAQMD	Hughes 500	177.1	17.71
Segment I - SCAQMD	Hughes 500	141.5	14.15
Segment J - SCAQMD	Hughes 500	119.7	11.97

Relating Factors to Potential Construction/Operating Helicopters

	Helicopter Type	Engine HP	Number	Emissions lbs/hour							
				HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Approach/Climbout	Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10	812.29	0.02	0.03
Idle	Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01	169.86	0.00	0.01

Maximum Daily Emissions, lbs (all segments)

	Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
All Segments	Hughes 500	2.10	4.69	9.58	0.08	0.52	4146.37	0.12	0.13

Total Emissions (lbs)

	Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Segment A - KCAPCD	Hughes 500	55.52	124.39	253.98	2.11	13.82	109878.76	3.07	3.53
Segment B - KCAPCD	Hughes 500	85.06	190.57	389.12	3.23	21.17	168342.55	4.71	5.41
Segment B - AVAQMD	Hughes 500	25.98	58.20	118.84	0.99	6.47	51414.97	1.44	1.65
Segment C - AVAQMD	Hughes 500	90.84	203.52	415.57	3.45	22.61	179786.53	5.03	5.77
Segment D - KCAPCD	Hughes 500	52.50	117.63	240.18	1.99	13.07	103907.99	2.91	3.34
Segment D - AVAQMD	Hughes 500	55.31	123.92	253.02	2.10	13.77	109464.12	3.06	3.52
Segment D - SCAQMD	Hughes 500	93.32	209.06	426.88	3.54	23.23	184679.24	5.17	5.93
Segment E - AVAQMD	Hughes 500	21.08	47.22	96.42	0.80	5.25	41712.47	1.17	1.34
Segment E - SCAQMD	Hughes 500	30.38	68.06	138.97	1.15	7.56	60122.34	1.68	1.93
Segment F - AVAQMD	Hughes 500	15.08	33.80	69.01	0.57	3.75	29853.85	0.84	0.96
Segment G - AVAQMD	Hughes 500	25.98	58.20	118.84	0.99	6.47	51414.97	1.44	1.65
Segment G - SCAQMD	Hughes 500	61.18	137.06	279.86	2.32	15.23	121073.95	3.39	3.89
Segment H - AVAQMD	Hughes 500	21.79	48.82	99.68	0.83	5.42	43122.23	1.21	1.38
Segment H - SCAQMD	Hughes 500	61.05	136.78	279.28	2.32	15.20	120825.17	3.38	3.88
Segment I - AVAQMD	Hughes 500	74.21	166.25	339.47	2.81	18.47	146864.37	4.11	4.72
Segment I - SCAQMD	Hughes 500	59.29	132.83	271.23	2.25	14.76	117342.22	3.28	3.77
Segment J - SCAQMD	Hughes 500	50.16	112.37	229.44	1.90	12.48	99264.06	2.78	3.19

Total Emissions (ton)

	Helicopter Type	HC	CO	NOx	SOx	PM	CO2	CH4	N2O
Segment A - KCAPCD	Hughes 500	0.03	0.06	0.13	0.00	0.01	54.94	0.00	0.00
Segment B - KCAPCD	Hughes 500	0.04	0.10	0.19	0.00	0.01	84.17	0.00	0.00
Segment B - AVAQMD	Hughes 500	0.01	0.03	0.06	0.00	0.00	25.71	0.00	0.00
Segment C - AVAQMD	Hughes 500	0.05	0.10	0.21	0.00	0.01	89.89	0.00	0.00
Segment D - KCAPCD	Hughes 500	0.03	0.06	0.12	0.00	0.01	51.95	0.00	0.00
Segment D - AVAQMD	Hughes 500	0.03	0.06	0.13	0.00	0.01	54.73	0.00	0.00
Segment D - SCAQMD	Hughes 500	0.05	0.10	0.21	0.00	0.01	92.34	0.00	0.00
Segment E - AVAQMD	Hughes 500	0.01	0.02	0.05	0.00	0.00	20.86	0.00	0.00
Segment E - SCAQMD	Hughes 500	0.02	0.03	0.07	0.00	0.00	30.06	0.00	0.00
Segment F - AVAQMD	Hughes 500	0.01	0.02	0.03	0.00	0.00	14.93	0.00	0.00
Segment G - AVAQMD	Hughes 500	0.01	0.03	0.06	0.00	0.00	25.71	0.00	0.00
Segment G - SCAQMD	Hughes 500	0.03	0.07	0.14	0.00	0.01	60.54	0.00	0.00
Segment H - AVAQMD	Hughes 500	0.01	0.02	0.05	0.00	0.00	21.56	0.00	0.00
Segment H - SCAQMD	Hughes 500	0.03	0.07	0.14	0.00	0.01	60.41	0.00	0.00
Segment I - AVAQMD	Hughes 500	0.04	0.08	0.17	0.00	0.01	73.43	0.00	0.00
Segment I - SCAQMD	Hughes 500	0.03	0.07	0.14	0.00	0.01	58.67	0.00	0.00
Segment J - SCAQMD	Hughes 500	0.03	0.06	0.11	0.00	0.01	49.63	0.00	0.00

Table A-21
Construction Emissions - Segment A
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

Emissions Summary - 2013

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
A	**Miles per Air District**						
KCAPCD	13.25						
Construction Inspection							
Worker Trips		0.00	0.08	0.01	0.00	0.39	0.04
Construction Trucks		0.00	0.07	0.01	0.00	0.39	0.04
		0.01	**0.15**	**0.01**	**0.00**	**0.77**	**0.08**
Marshalling Yards							
Heavy Construction Equipment		0.04	0.28	0.26	0.00	0.02	0.02
Worker Trips		0.00	0.08	0.01	0.00	0.39	0.04
Construction Trucks		0.01	0.05	0.06	0.00	0.42	0.05
		0.05	**0.41**	**0.33**	**0.00**	**0.83**	**0.11**
Survey							
Worker Trips		0.00	0.02	0.00	0.00	0.08	0.01
Construction Trucks		0.00	0.01	0.00	0.00	0.04	0.00
		0.00	**0.02**	**0.00**	**0.00**	**0.11**	**0.01**
Road Work and Structure Pads							
Heavy Construction Equipment		0.09	0.41	0.70	0.00	0.04	0.04
Worker Trips		0.00	0.04	0.00	0.00	0.19	0.02
Construction Trucks		0.00	0.02	0.06	0.00	0.31	0.04
Fugitive Dust						1.51	0.52
		0.10	**0.47**	**0.76**	**0.00**	**2.05**	**0.61**
Guard Poles							
Heavy Construction Equipment		0.00	0.01	0.03	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.05	0.01
Construction Trucks		0.00	0.00	0.01	0.00	0.03	0.00
		0.00	**0.02**	**0.03**	**0.00**	**0.08**	**0.01**
Foundations and Rebar Cages							
Heavy Construction Equipment		0.11	0.58	0.94	0.00	0.04	0.04
Worker Trips		0.01	0.18	0.02	0.00	0.86	0.09
Construction Trucks		0.00	0.00	0.01	0.00	0.10	0.01
Fugitive Dust						0.00	0.00
		0.12	**0.77**	**0.98**	**0.00**	**1.00**	**0.14**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection)							
Heavy Construction Equipment		0.41	6.09	1.37	0.00	0.03	0.02
Worker Trips		0.03	0.57	0.06	0.00	2.70	0.27
Construction Trucks		0.00	0.10	0.03	0.00	0.67	0.07
		0.44	**6.77**	**1.46**	**0.00**	**3.40**	**0.37**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending)							
Heavy Construction Equipment		0.08	0.65	0.60	0.00	0.03	0.02
Worker Trips		0.01	0.18	0.02	0.00	0.87	0.09
Construction Trucks		0.00	0.11	0.15	0.00	0.62	0.07
Helicopter		0.03	0.06	0.13	0.00	0.01	0.01
		0.12	**1.00**	**0.89**	**0.00**	**1.52**	**0.18**
Cleanup and Restoration							
Heavy Construction Equipment		0.04	0.22	0.31	0.00	0.02	0.02
Worker Trips		0.00	0.03	0.00	0.00	0.16	0.02
Construction Trucks		0.00	0.00	0.00	0.00	0.11	0.01
		0.04	**0.26**	**0.32**	**0.00**	**0.29**	**0.05**
Total Segment A - KCAPCD	**Max Day**	0.89	9.87	4.78	0.01	10.07	1.55
Total Segment A - BLM	**3.67**	0.25	2.73	1.32	0.00	2.79	0.43
Total Segment A - USFS	**0**						

Table A-23
Construction Emissions - Segment C
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

Emissions Summary - 2013

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
C	**Miles per Air District**						
KCAPCD	21.68						
Construction Inspection							
Worker Trips		0.01	0.13	0.01	0.00	0.63	0.06
Construction Trucks		0.00	0.11	0.01	0.00	0.63	0.06
		0.01	**0.25**	**0.02**	**0.00**	**1.26**	**0.13**
Marshalling Yards							
Heavy Construction Equipment		0.07	0.45	0.43	0.00	0.04	0.03
Worker Trips		0.01	0.13	0.01	0.00	0.63	0.06
Construction Trucks		0.01	0.09	0.10	0.00	0.69	0.08
		0.08	**0.67**	**0.54**	**0.00**	**1.35**	**0.18**
Survey							
Worker Trips		0.00	0.03	0.00	0.00	0.12	0.01
Construction Trucks		0.00	0.01	0.00	0.00	0.06	0.01
		0.00	**0.04**	**0.00**	**0.00**	**0.19**	**0.02**
Road Work and Structure Pads							
Heavy Construction Equipment		0.15	0.67	1.15	0.00	0.07	0.06
Worker Trips		0.00	0.07	0.01	0.00	0.31	0.03
Construction Trucks		0.01	0.03	0.09	0.00	0.51	0.06
Fugitive Dust						2.46	0.85
		0.16	**0.77**	**1.25**	**0.00**	**3.35**	**1.00**
Guard Poles							
Heavy Construction Equipment		0.00	0.01	0.04	0.00	0.00	0.00
Worker Trips		0.00	0.02	0.00	0.00	0.08	0.01
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.01	**0.03**	**0.06**	**0.00**	**0.13**	**0.02**
Foundations and Rebar Cages							
Heavy Construction Equipment		0.18	0.95	1.54	0.00	0.06	0.06
Worker Trips		0.01	0.30	0.03	0.00	1.40	0.14
Construction Trucks		0.00	0.01	0.02	0.00	0.17	0.02
Fugitive Dust						0.00	0.00
		0.20	**1.26**	**1.60**	**0.00**	**1.64**	**0.22**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection)							
Heavy Construction Equipment		0.67	9.97	2.25	0.00	0.04	0.04
Worker Trips		0.05	0.94	0.09	0.00	4.42	0.45
Construction Trucks		0.01	0.17	0.05	0.00	1.10	0.12
		0.72	**11.07**	**2.39**	**0.00**	**5.56**	**0.60**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending)							
Heavy Construction Equipment		0.13	1.06	0.97	0.00	0.04	0.04
Worker Trips		0.01	0.30	0.03	0.00	1.42	0.14
Construction Trucks		0.01	0.18	0.24	0.00	1.02	0.11
Helicopter		0.05	0.10	0.21	0.00	0.01	0.01
		0.20	**1.64**	**1.45**	**0.00**	**2.49**	**0.30**
Cleanup and Restoration							
Heavy Construction Equipment		0.07	0.36	0.51	0.00	0.03	0.03
Worker Trips		0.00	0.06	0.01	0.00	0.26	0.03
Construction Trucks		0.00	0.00	0.01	0.00	0.18	0.02
		0.07	**0.42**	**0.52**	**0.00**	**0.48**	**0.08**
Total Segment C - KCAPCD	**Max Daily**	**1.45**	**16.15**	**7.83**	**0.01**	**16.46**	**2.54**
Total Segment C - BLM	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment C - USFS	**0**	0.00	0.00	0.00	0.00	0.00	0.00

Table A-24
Construction Emissions - Segment D
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

Emissions Summary - 2013

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
D	**Miles per Air District**						
KCAPCD	12.53						
Construction Inspection							
Worker Trips		0.00	0.08	0.01	0.00	0.37	0.04
Construction Trucks		0.00	0.07	0.01	0.00	0.37	0.04
		0.01	**0.14**	**0.01**	**0.00**	**0.73**	**0.07**
Marshalling Yards							
Heavy Construction Equipment		0.04	0.26	0.25	0.00	0.02	0.02
Worker Trips		0.00	0.08	0.01	0.00	0.37	0.04
Construction Trucks		0.00	0.05	0.06	0.00	0.40	0.05
		0.05	**0.39**	**0.31**	**0.00**	**0.78**	**0.10**
Survey							
Worker Trips		0.00	0.02	0.00	0.00	0.07	0.01
Construction Trucks		0.00	0.01	0.00	0.00	0.04	0.00
		0.00	**0.02**	**0.00**	**0.00**	**0.11**	**0.01**
Road Work and Structure Pads							
Heavy Construction Equipment		0.09	0.39	0.67	0.00	0.04	0.03
Worker Trips		0.00	0.04	0.00	0.00	0.18	0.02
Construction Trucks		0.00	0.02	0.05	0.00	0.30	0.04
Fugitive Dust						1.62	0.53
		0.09	**0.44**	**0.72**	**0.00**	**2.13**	**0.62**
Guard Poles							
Heavy Construction Equipment		0.00	0.01	0.02	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.05	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.03	0.00
		0.00	**0.02**	**0.03**	**0.00**	**0.08**	**0.01**
Foundations and Rebar Cages							
Heavy Construction Equipment		0.10	0.55	0.89	0.00	0.04	0.03
Worker Trips		0.01	0.17	0.02	0.00	0.81	0.08
Construction Trucks		0.00	0.00	0.01	0.00	0.10	0.01
Fugitive Dust						0.00	0.00
		0.11	**0.73**	**0.92**	**0.00**	**0.95**	**0.13**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection)							
Heavy Construction Equipment		0.38	5.76	1.30	0.00	0.02	0.02
Worker Trips		0.03	0.54	0.05	0.00	2.56	0.26
Construction Trucks		0.00	0.10	0.03	0.00	0.64	0.07
		0.42	**6.40**	**1.38**	**0.00**	**3.22**	**0.35**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending)							
Heavy Construction Equipment		0.08	0.61	0.56	0.00	0.02	0.02
Worker Trips		0.01	0.17	0.02	0.00	0.82	0.08
Construction Trucks		0.00	0.10	0.14	0.00	0.59	0.06
Helicopter		0.03	0.06	0.12	0.00	0.01	0.01
		0.12	**0.95**	**0.84**	**0.00**	**1.44**	**0.17**
Cleanup and Restoration							
Heavy Construction Equipment		0.04	0.21	0.29	0.00	0.02	0.02
Worker Trips		0.00	0.03	0.00	0.00	0.15	0.02
Construction Trucks		0.00	0.00	0.00	0.00	0.11	0.01
		0.04	**0.24**	**0.30**	**0.00**	**0.28**	**0.04**
	Max Daily	**0.84**	**9.33**	**4.52**	**0.01**	**9.71**	**1.51**
Total Segment A - USFS							
D	**Miles per Air District**						
AVAQMD	13.20						
Construction Inspection							

Table A-24
Construction Emissions - Segment D
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

		Emissions, tons/year						
Segment		**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**	
Worker Trips		0.00	0.08	0.01	0.00	0.38	0.04	
Construction Trucks		0.00	0.07	0.01	0.00	0.38	0.04	
		0.01	**0.15**	**0.01**	**0.00**	**0.77**	**0.08**	
Marshalling Yards								
Heavy Construction Equipment		0.04	0.27	0.26	0.00	0.02	0.02	
Worker Trips		0.00	0.08	0.01	0.00	0.38	0.04	
Construction Trucks		0.01	0.05	0.06	0.00	0.42	0.05	
		0.05	**0.41**	**0.33**	**0.00**	**0.82**	**0.11**	
Survey								
Worker Trips		0.00	0.10	0.01	0.00	0.46	0.05	
Construction Trucks		0.00	0.01	0.00	0.00	0.04	0.00	
		0.01	**0.10**	**0.01**	**0.00**	**0.49**	**0.05**	
Road Work and Structure Pads								
Heavy Construction Equipment		0.09	0.41	0.70	0.00	0.04	0.04	
Worker Trips		0.00	0.04	0.00	0.00	0.19	0.02	
Construction Trucks		0.00	0.02	0.06	0.00	0.31	0.04	
Fugitive Dust						1.70	0.56	
		0.10	**0.47**	**0.76**	**0.00**	**2.24**	**0.65**	
Guard Poles								
Heavy Construction Equipment		0.00	0.01	0.03	0.00	0.00	0.00	
Worker Trips		0.01	0.18	0.02	0.00	0.85	0.09	
Construction Trucks		0.00	0.00	0.01	0.00	0.03	0.00	
		0.01	**0.19**	**0.05**	**0.00**	**0.89**	**0.09**	
Foundations and Rebar Cages								
Heavy Construction Equipment		0.11	0.58	0.94	0.00	0.04	0.03	
Worker Trips		0.01	0.18	0.02	0.00	0.85	0.09	
Construction Trucks		0.00	0.00	0.01	0.00	0.10	0.01	
Fugitive Dust						0.00	0.00	
		0.12	**0.76**	**0.97**	**0.00**	**1.00**	**0.13**	
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection)								
Heavy Construction Equipment		0.41	6.07	1.37	0.00	0.03	0.02	
Worker Trips		0.03	0.57	0.06	0.00	2.69	0.27	
Construction Trucks		0.00	0.10	0.03	0.00	0.67	0.07	
		0.44	**6.74**	**1.45**	**0.00**	**3.39**	**0.37**	
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending)								
Heavy Construction Equipment		0.08	0.65	0.59	0.00	0.03	0.02	
Worker Trips		0.01	0.18	0.02	0.00	0.87	0.09	
Construction Trucks		0.00	0.11	0.15	0.00	0.62	0.07	
Helicopter		0.03	0.06	0.13	0.00	0.01	0.00	
		0.12	**1.00**	**0.89**	**0.00**	**1.52**	**0.18**	
Cleanup and Restoration								
Heavy Construction Equipment		0.04	0.22	0.31	0.00	0.02	0.02	
Worker Trips		0.00	0.03	0.00	0.00	0.16	0.02	
Construction Trucks		0.00	0.00	0.00	0.00	0.11	0.01	
		0.04	**0.26**	**0.31**	**0.00**	**0.29**	**0.05**	
Total Segment A - USFS	**Max Daily**	**0.90**	**10.08**	**4.79**	**0.01**	**11.42**	**1.71**	**940.62**
D	**Miles per Air District**							
SCAQMD	22.27							
Construction Inspection								
Worker Trips		0.01	0.14	0.01	0.00	0.65	0.07	
Construction Trucks		0.00	0.12	0.01	0.00	0.65	0.07	
		0.01	**0.26**	**0.02**	**0.00**	**1.30**	**0.13**	
Marshalling Yards								

Table A-24
Construction Emissions - Segment D
New 230 kV Transmission Line
Barren Ridge Renewable Transmission Project

		Emissions, tons/year					
		ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
Segment							
Heavy Construction Equipment		0.07	0.46	0.44	0.00	0.04	0.03
Worker Trips		0.01	0.14	0.01	0.00	0.65	0.07
Construction Trucks		0.01	0.09	0.10	0.00	0.71	0.08
		0.09	**0.69**	**0.55**	**0.00**	**1.39**	**0.18**
Survey							
Worker Trips		0.01	0.16	0.02	0.00	0.77	0.08
Construction Trucks		0.00	0.01	0.00	0.00	0.06	0.01
		0.01	**0.17**	**0.02**	**0.00**	**0.83**	**0.08**
Road Work and Structure Pads							
Heavy Construction Equipment		0.16	0.69	1.18	0.00	0.07	0.06
Worker Trips		0.00	0.07	0.01	0.00	0.32	0.03
Construction Trucks		0.01	0.03	0.09	0.00	0.53	0.06
Fugitive Dust						2.87	0.95
		0.17	**0.79**	**1.29**	**0.00**	**3.79**	**1.10**
Guard Poles							
Heavy Construction Equipment		0.00	0.01	0.04	0.00	0.00	0.00
Worker Trips		0.02	0.31	0.03	0.00	1.44	0.15
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.02	**0.32**	**0.09**	**0.00**	**1.49**	**0.15**
Foundations and Rebar Cages							
Heavy Construction Equipment		0.18	0.98	1.59	0.00	0.07	0.06
Worker Trips		0.02	0.31	0.03	0.00	1.44	0.15
Construction Trucks		0.00	0.01	0.02	0.00	0.18	0.02
Fugitive Dust						0.00	0.00
		0.20	**1.29**	**1.64**	**0.00**	**1.69**	**0.23**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection)							
Heavy Construction Equipment		0.68	10.24	2.31	0.00	0.04	0.04
Worker Trips		0.05	0.96	0.09	0.00	4.54	0.46
Construction Trucks		0.01	0.17	0.05	0.00	1.13	0.12
		0.74	**11.37**	**2.45**	**0.00**	**5.72**	**0.62**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending)							
Heavy Construction Equipment		0.14	1.09	1.00	0.00	0.04	0.04
Worker Trips		0.02	0.31	0.03	0.00	1.46	0.15
Construction Trucks		0.01	0.18	0.25	0.00	1.05	0.11
Helicopter		0.05	0.10	0.21	0.00	0.01	0.01
		0.21	**1.69**	**1.49**	**0.00**	**2.56**	**0.31**
Cleanup and Restoration							
Heavy Construction Equipment		0.07	0.37	0.52	0.00	0.03	0.03
Worker Trips		0.00	0.06	0.01	0.00	0.27	0.03
Construction Trucks		0.00	0.00	0.01	0.00	0.19	0.02
		0.08	**0.43**	**0.53**	**0.00**	**0.49**	**0.08**
	Max Daily	**1.51**	**17.01**	**8.08**	**0.02**	**19.26**	**2.89**
Helicopter Emissions - Mitigation		**6.66**	**26.95**	**29.29**	**0.24**	**1.62**	**1.60**
Max Daily							
		8.17	**43.96**	**37.38**	**0.26**	**20.88**	**4.49**
Total Segment D - BLM	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment D - USFS KCAPCD	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment D - USFS AVAQMD	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment D - USFS SCAQMD	**15.91**	5.84	31.41	26.70	0.19	14.92	3.21

Table A-28
Construction Emissions - Segment A
Reconductoring
Barren Ridge Renewable Transmission Project

Emissions Summary - Reconductoring

		Emissions, tons/year					
Segment		**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
A	**Miles per Air District**						
KCAPCD	13.25						
Construction Inspection - 2014							
Worker Trips		0.00	0.04	0.00	0.00	0.19	0.02
Construction Trucks		0.00	0.03	0.00	0.00	0.33	0.05
		0.00	**0.07**	**0.01**	**0.00**	**0.52**	**0.07**
Marshalling Yards - 2014							
Heavy Construction Equipment		0.02	0.14	0.12	0.00	0.01	0.01
Worker Trips		0.00	0.04	0.00	0.00	0.19	0.02
Construction Trucks		0.00	0.02	0.03	0.00	0.28	0.04
		0.02	**0.20**	**0.15**	**0.00**	**0.48**	**0.07**
Survey - 2014							
Worker Trips		0.00	0.00	0.00	0.00	0.02	0.00
Construction Trucks		0.00	0.00	0.00	0.00	0.02	0.00
		0.00	**0.01**	**0.00**	**0.00**	**0.04**	**0.01**
Road Work and Structure Pads - 2014							
Heavy Construction Equipment		0.01	0.07	0.10	0.00	0.01	0.01
Worker Trips		0.00	0.01	0.00	0.00	0.06	0.01
Construction Trucks		0.00	0.01	0.02	0.00	0.11	0.02
Fugitive Dust						1.51	0.52
		0.02	**0.08**	**0.12**	**0.00**	**1.68**	**0.55**
Wreck Out - 2014							
Heavy Construction Equipment		0.09	0.47	0.66	0.00	0.03	0.02
Worker Trips		0.01	0.15	0.01	0.00	0.76	0.08
Construction Trucks		0.01	0.05	0.09	0.00	0.87	0.12
Helicopter		2.08	6.06	8.13	0.07	0.45	0.44
		2.18	**6.72**	**8.89**	**0.07**	**2.10**	**0.66**
Guard Poles - 2014							
Heavy Construction Equipment		0.00	0.01	0.03	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.10	0.01
		0.00	**0.02**	**0.04**	**0.00**	**0.14**	**0.02**
Foundations and Rebar Cages - 2014							
Heavy Construction Equipment		0.04	0.35	0.28	0.00	0.01	0.01
Worker Trips		0.00	0.06	0.01	0.00	0.29	0.03
Construction Trucks		0.00	0.02	0.06	0.00	0.56	0.08
Fugitive Dust						0.00	0.00
		0.04	**0.42**	**0.35**	**0.00**	**0.86**	**0.12**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014							
Heavy Construction Equipment		0.16	2.44	0.54	0.00	0.01	0.01
Worker Trips		0.01	0.21	0.02	0.00	1.08	0.11
Construction Trucks		0.00	0.04	0.01	0.00	0.43	0.06
		0.17	**2.68**	**0.57**	**0.00**	**1.52**	**0.18**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.03	0.11	0.24	0.00	0.01	0.01
Worker Trips		0.00	0.09	0.01	0.00	0.46	0.05
Construction Trucks		0.01	0.05	0.07	0.00	0.91	0.12
Helicopter Emissions		2.08	6.06	8.13	0.07	0.45	0.44
		2.12	**6.32**	**8.44**	**0.07**	**1.83**	**0.62**
Cleanup and Restoration - 2014							
Heavy Construction Equipment		0.02	0.10	0.13	0.00	0.01	0.01
Worker Trips		0.00	0.02	0.00	0.00	0.08	0.01
Construction Trucks		0.00	0.01	0.02	0.00	0.11	0.02
		0.02	**0.12**	**0.15**	**0.00**	**0.20**	**0.03**
Total Segment A - KCAPCD	**Max Daily**	**4.58**	**16.65**	**18.72**	**0.14**	**9.39**	**2.31**
Total Segment A - BLM	**3.67**	1.27	4.61	5.19	0.04	2.60	0.64
Total Segment A - USFS	**0**						

Table A-29
Construction Emissions - Segment B
Reconductoring
Barren Ridge Renewable Transmission Project

Emissions Summary - Reconductoring

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
B	**Miles per Air District**						
KCAPCD	20.30						
Construction Inspection - 2014							
Worker Trips		0.00	0.06	0.01	0.00	0.30	0.03
Construction Trucks		0.00	0.05	0.00	0.00	0.50	0.07
		0.00	**0.11**	**0.01**	**0.00**	**0.80**	**0.10**
Marshalling Yards - 2014							
Heavy Construction Equipment		0.03	0.21	0.19	0.00	0.02	0.01
Worker Trips		0.00	0.06	0.01	0.00	0.30	0.03
Construction Trucks		0.00	0.04	0.04	0.00	0.43	0.06
		0.04	**0.31**	**0.24**	**0.00**	**0.74**	**0.10**
Survey - 2014							
Worker Trips		0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks		0.00	0.00	0.00	0.00	0.03	0.00
		0.00	**0.01**	**0.00**	**0.00**	**0.06**	**0.01**
Road Work and Structure Pads - 2014							
Heavy Construction Equipment		0.02	0.10	0.16	0.00	0.01	0.01
Worker Trips		0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks		0.00	0.01	0.02	0.00	0.17	0.02
Fugitive Dust						2.31	0.80
		0.02	**0.12**	**0.18**	**0.00**	**2.58**	**0.84**
Wreck Out - 2014							
Heavy Construction Equipment		0.13	0.71	1.01	0.00	0.04	0.04
Worker Trips		0.01	0.22	0.02	0.00	1.17	0.12
Construction Trucks		0.01	0.07	0.13	0.00	1.33	0.18
Helicopter		3.47	11.39	15.14	0.13	0.83	0.82
		3.62	**12.39**	**16.31**	**0.13**	**3.37**	**1.16**
Guard Poles - 2014							
Heavy Construction Equipment		0.01	0.02	0.05	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.06	0.01
Construction Trucks		0.00	0.00	0.02	0.00	0.15	0.02
		0.01	**0.04**	**0.07**	**0.00**	**0.21**	**0.03**
Foundations and Rebar Cages - 2014							
Heavy Construction Equipment		0.06	0.53	0.44	0.00	0.02	0.02
Worker Trips		0.00	0.08	0.01	0.00	0.44	0.04
Construction Trucks		0.00	0.03	0.09	0.00	0.86	0.12
Fugitive Dust						0.00	0.00
		0.07	**0.65**	**0.53**	**0.00**	**1.32**	**0.18**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014							
Heavy Construction Equipment		0.25	3.73	0.83	0.00	0.01	0.01
Worker Trips		0.02	0.32	0.03	0.00	1.66	0.17
Construction Trucks		0.00	0.06	0.02	0.00	0.66	0.09
		0.27	**4.11**	**0.87**	**0.00**	**2.33**	**0.28**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.04	0.17	0.36	0.00	0.01	0.01
Worker Trips		0.01	0.14	0.01	0.00	0.71	0.07
Construction Trucks		0.01	0.08	0.11	0.00	1.40	0.19
Helicopter Emissions		3.47	11.39	15.14	0.13	0.83	0.82

Table A-29
Construction Emissions - Segment B
Reconductoring
Barren Ridge Renewable Transmission Project

			Emissions, tons/year					
Segment			**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
			3.53	**11.77**	**15.63**	**0.13**	**2.95**	**1.10**
Cleanup and Restoration - 2014								
Heavy Construction Equipment			0.03	0.16	0.20	0.00	0.01	0.01
Worker Trips			0.00	0.02	0.00	0.00	0.12	0.01
Construction Trucks			0.00	0.01	0.02	0.00	0.17	0.02
			0.03	**0.19**	**0.23**	**0.00**	**0.31**	**0.05**
Total Segment B - KCAPCD	Max Daily		**7.59**	**29.70**	**34.07**	**0.26**	**14.68**	**3.83**
B	**Miles per Air District**							
AVAQMD	6.20							
Construction Inspection - 2014								
Worker Trips			0.00	0.06	0.01	0.00	0.30	0.03
Construction Trucks			0.00	0.05	0.00	0.00	0.50	0.07
			0.00	**0.11**	**0.01**	**0.00**	**0.80**	**0.10**
Marshalling Yards - 2014								
Heavy Construction Equipment			0.03	0.21	0.19	0.00	0.02	0.01
Worker Trips			0.00	0.06	0.01	0.00	0.30	0.03
Construction Trucks			0.00	0.04	0.04	0.00	0.43	0.06
			0.04	**0.31**	**0.24**	**0.00**	**0.74**	**0.10**
Survey - 2014								
Worker Trips			0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks			0.00	0.00	0.00	0.00	0.03	0.00
			0.00	**0.01**	**0.00**	**0.00**	**0.06**	**0.01**
Road Work and Structure Pads - 2014								
Heavy Construction Equipment			0.02	0.10	0.16	0.00	0.01	0.01
Worker Trips			0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks			0.00	0.01	0.02	0.00	0.17	0.02
Fugitive Dust							0.70	0.24
			0.02	**0.12**	**0.18**	**0.00**	**0.98**	**0.28**
Wreck Out - 2014								
Heavy Construction Equipment			0.13	0.71	1.01	0.00	0.04	0.04
Worker Trips			0.01	0.22	0.02	0.00	1.17	0.12
Construction Trucks			0.01	0.07	0.13	0.00	1.33	0.18
Helicopter			1.12	3.71	4.94	0.04	0.27	0.27
			0.15	**1.01**	**1.17**	**0.00**	**2.54**	**0.33**
Guard Poles - 2014								
Heavy Construction Equipment			0.01	0.02	0.05	0.00	0.00	0.00
Worker Trips			0.00	0.01	0.00	0.00	0.06	0.01
Construction Trucks			0.00	0.00	0.02	0.00	0.15	0.02
			0.01	**0.04**	**0.07**	**0.00**	**0.21**	**0.03**
Foundations and Rebar Cages - 2014								
Heavy Construction Equipment			0.06	0.53	0.44	0.00	0.02	0.02
Worker Trips			0.00	0.08	0.01	0.00	0.44	0.04
Construction Trucks			0.00	0.03	0.09	0.00	0.86	0.12
Fugitive Dust							0.00	0.00
			0.07	**0.65**	**0.53**	**0.00**	**1.32**	**0.18**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014								
Heavy Construction Equipment			0.25	3.73	0.83	0.00	0.01	0.01
Worker Trips			0.02	0.32	0.03	0.00	1.66	0.17

Table A-29
Construction Emissions - Segment B
Reconductoring
Barren Ridge Renewable Transmission Project

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
Construction Trucks		0.00	0.06	0.02	0.00	0.66	0.09
		0.27	**4.11**	**0.87**	**0.00**	**2.33**	**0.28**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.04	0.17	0.36	0.00	0.01	0.01
Worker Trips		0.01	0.14	0.01	0.00	0.71	0.07
Construction Trucks		0.01	0.08	0.11	0.00	1.40	0.19
Helicopter Emissions		1.12	3.71	4.94	0.04	0.27	0.27
		1.18	**4.10**	**5.42**	**0.04**	**2.39**	**0.54**
Cleanup and Restoration - 2014							
Heavy Construction Equipment		0.03	0.16	0.20	0.00	0.01	0.01
Worker Trips		0.00	0.02	0.00	0.00	0.12	0.01
Construction Trucks		0.00	0.01	0.02	0.00	0.17	0.02
		0.03	**0.19**	**0.23**	**0.00**	**0.31**	**0.05**
Total Segment B - AVAQMD	Max Daily	**1.77**	**10.64**	**8.72**	**0.05**	**11.68**	**1.90**
Total Segment B - BLM	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment B - USFS	**0**	0.00	0.00	0.00	0.00	0.00	0.00

Table A-30
Construction Emissions - Segment G
Reconductoring
Barren Ridge Renewable Transmission Project

Emissions Summary - Reconductoring

		Emissions, tons/year					
Segment		**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
G	**Miles per Air District**						
AVAQMD	6.20						
Construction Inspection - 2014							
Worker Trips		0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks		0.00	0.02	0.00	0.00	0.15	0.02
		0.00	**0.03**	**0.00**	**0.00**	**0.25**	**0.03**
Marshalling Yards - 2014							
Heavy Construction Equipment		0.01	0.06	0.06	0.00	0.00	0.00
Worker Trips		0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks		0.00	0.01	0.01	0.00	0.13	0.02
		0.01	**0.09**	**0.07**	**0.00**	**0.23**	**0.03**
Survey - 2014							
Worker Trips		0.00	0.00	0.00	0.00	0.01	0.00
Construction Trucks		0.00	0.00	0.00	0.00	0.01	0.00
		0.00	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**
Road Work and Structure Pads - 2014							
Heavy Construction Equipment		0.01	0.03	0.05	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.03	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
Fugitive Dust						0.82	0.27
		0.01	**0.04**	**0.06**	**0.00**	**0.91**	**0.28**
Wreck Out - 2014							
Heavy Construction Equipment		0.04	0.22	0.31	0.00	0.01	0.01
Worker Trips		0.00	0.07	0.01	0.00	0.36	0.04
Construction Trucks		0.00	0.02	0.04	0.00	0.41	0.05
Helicopter		1.12	3.71	4.94	0.04	0.27	0.27
		1.17	**4.02**	**5.30**	**0.04**	**1.05**	**0.37**
Guard Poles - 2014							
Heavy Construction Equipment		0.00	0.01	0.01	0.00	0.00	0.00
Worker Trips		0.00	0.00	0.00	0.00	0.02	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.00	**0.01**	**0.02**	**0.00**	**0.07**	**0.01**
Foundations and Rebar Cages - 2014							
Heavy Construction Equipment		0.02	0.16	0.13	0.00	0.01	0.00
Worker Trips		0.00	0.03	0.00	0.00	0.13	0.01
Construction Trucks		0.00	0.01	0.03	0.00	0.26	0.04
Fugitive Dust						0.00	0.00
		0.02	**0.20**	**0.16**	**0.00**	**0.40**	**0.05**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014							
Heavy Construction Equipment		0.08	1.14	0.25	0.00	0.00	0.00
Worker Trips		0.00	0.10	0.01	0.00	0.51	0.05
Construction Trucks		0.00	0.02	0.01	0.00	0.20	0.03
		0.08	**1.25**	**0.27**	**0.00**	**0.71**	**0.08**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.01	0.05	0.11	0.00	0.00	0.00
Worker Trips		0.00	0.04	0.00	0.00	0.22	0.02
Construction Trucks		0.00	0.03	0.03	0.00	0.43	0.06
Helicopter Emissions		1.12	3.71	4.94	0.04	0.27	0.27

Table A-30
Construction Emissions - Segment G
Reconductoring
Barren Ridge Renewable Transmission Project

		Emissions, tons/year					
		ROG tons (total)	CO tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
Segment							
		1.14	**3.83**	**5.09**	**0.04**	**0.92**	**0.35**
Cleanup and Restoration - 2014							
Heavy Construction Equipment		0.01	0.05	0.06	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.01	**0.06**	**0.07**	**0.00**	**0.09**	**0.01**
Total Segment G - AVAQMD	Max Daily	**2.45**	**9.53**	**11.03**	**0.08**	**4.64**	**1.23**
G	**Miles per Air District**						
SCAQMD	14.60						
Construction Inspection - 2014							
Worker Trips		0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks		0.00	0.02	0.00	0.00	0.15	0.02
		0.00	**0.03**	**0.00**	**0.00**	**0.25**	**0.03**
Marshalling Yards - 2014							
Heavy Construction Equipment		0.01	0.06	0.06	0.00	0.00	0.00
Worker Trips		0.00	0.02	0.00	0.00	0.09	0.01
Construction Trucks		0.00	0.01	0.01	0.00	0.13	0.02
		0.01	**0.09**	**0.07**	**0.00**	**0.23**	**0.03**
Survey - 2014							
Worker Trips		0.00	0.00	0.00	0.00	0.01	0.00
Construction Trucks		0.00	0.00	0.00	0.00	0.01	0.00
		0.00	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**
Road Work and Structure Pads - 2014							
Heavy Construction Equipment		0.01	0.03	0.05	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.03	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
Fugitive Dust						1.94	0.63
		0.01	**0.04**	**0.06**	**0.00**	**2.02**	**0.65**
Wreck Out - 2014							
Heavy Construction Equipment		0.04	0.22	0.31	0.00	0.01	0.01
Worker Trips		0.00	0.07	0.01	0.00	0.36	0.04
Construction Trucks		0.00	0.02	0.04	0.00	0.41	0.05
Helicopter		2.51	8.25	10.98	0.09	0.60	0.60
		2.56	**8.56**	**11.33**	**0.09**	**1.38**	**0.70**
Guard Poles - 2014							
Heavy Construction Equipment		0.00	0.01	0.01	0.00	0.00	0.00
Worker Trips		0.00	0.00	0.00	0.00	0.02	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.00	**0.01**	**0.02**	**0.00**	**0.07**	**0.01**
Foundations and Rebar Cages - 2014							
Heavy Construction Equipment		0.02	0.16	0.13	0.00	0.01	0.00
Worker Trips		0.00	0.03	0.00	0.00	0.13	0.01
Construction Trucks		0.00	0.01	0.03	0.00	0.26	0.04
Fugitive Dust						0.00	0.00
		0.02	**0.20**	**0.16**	**0.00**	**0.40**	**0.05**
Steel (Hauling, Shake-Out, Light Assembly, Heavy Assembly, Erection) - 2014							
Heavy Construction Equipment		0.08	1.14	0.25	0.00	0.00	0.00
Worker Trips		0.00	0.10	0.01	0.00	0.51	0.05

Table A-30
Construction Emissions - Segment G
Reconductoring
Barren Ridge Renewable Transmission Project

		Emissions, tons/year					
		ROG tons (total)	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**
Segment							
Construction Trucks		0.00	0.02	0.01	0.00	0.20	0.03
		0.08	**1.25**	**0.27**	**0.00**	**0.71**	**0.08**
Conductor (Sheaves, Insulators, Stringing, Clipping, Dampers, Deadending) - 2014							
Heavy Construction Equipment		0.01	0.05	0.11	0.00	0.00	0.00
Worker Trips		0.00	0.04	0.00	0.00	0.22	0.02
Construction Trucks		0.00	0.03	0.03	0.00	0.43	0.06
Helicopter Emissions		2.51	8.25	10.98	0.09	0.60	0.60
		2.53	**8.37**	**11.12**	**0.09**	**1.25**	**0.68**
Cleanup and Restoration - 2014							
Heavy Construction Equipment		0.01	0.05	0.06	0.00	0.00	0.00
Worker Trips		0.00	0.01	0.00	0.00	0.04	0.00
Construction Trucks		0.00	0.00	0.01	0.00	0.05	0.01
		0.01	**0.06**	**0.07**	**0.00**	**0.09**	**0.01**
Total Segment G - SCAQMD	Max Daily	**5.22**	**18.62**	**23.11**	**0.19**	**6.42**	**2.25**
Total Segment G - BLM	**0**	0.00	0.00	0.00	0.00	0.00	0.00
Total Segment G - USFS AVAQMD	**2.2**	0.87	3.38	3.92	0.03	1.65	0.44
Total Segment G - USFS SCAQMD	**12.99**	4.65	16.56	20.56	0.16	5.71	2.00

APPENDIX O:PROGRAMMATIC AGREEMENT

PROGRAMMATIC AGREEMENT
AMONG
THE U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE – ANGELES NATIONAL FOREST,
THE U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, AND THE LOS ANGELES DEPARTMENT OF WATER AND POWER
REGARDING
THE BARREN RIDGE RENEWABLE TRANSMISSION PROJECT, LOS ANGELES AND KERN COUNTIES, CALIFORNIA

WHEREAS, the Los Angeles Department of Water and Power's (LADWP) Barren Ridge Renewable Transmission Project (hereinafter, "BRRTP" or "Project") proposes: 1) constructing a new 230 kilovolt (kV) transmission line between the existing Barren Ridge Switching Station north of the city of Mojave southward to a proposed new switching station in Haskell Canyon north of Santa Clarita; 2) placing the new transmission line onto vacant positions on existing structures from Bee Canyon to Haskell Canyon; 3) installing a 230kV circuit onto existing towers between the proposed Haskell Switching Station and the existing Castaic Power Plant; 3) re-conductoring the existing Barren Ridge – Rinaldi (BR-RIN) 230kV Transmission Line from the Barren Ridge Switching Station to the Rinaldi Substation in the San Fernando Valley; 5) constructing the new Haskell Switching Station on LADWP-owned property in Haskell Canyon; and 6) expanding the existing Barren Ridge Switching Station north of Mojave (Figure 1, Appendix A); and

WHEREAS, the U.S. Department of Agriculture Forest Service, Angeles National Forest (ANF) and the U.S. Department of the Interior Bureau of Land Management (BLM) have determined that issuing permits or granting rights-of-way (ROW) for BRRTP and the demolition, construction, operation and maintenance activities for BRRTP on ANF- and BLM-administered lands and on other lands constitute an "Undertaking" as defined at 36 CFR § 800.16(y); and

WHEREAS, the ANF may issue Temporary Special Use Permits (TSUP) for BRRTP-related construction activities as well as a 50-year term Special Use Permit (SUP) or ROW for the selected BRRTP alternative on ANF-administered lands, pursuant to the Federal Land Policy and Management Act (FLPMA) (P.L. 94-579) of 1976, as amended, which authorizes the Forest Service to permit the occupancy, use, or traversing of National Forest lands for generation, transmission, and distribution of electrical power; and

WHEREAS, the BLM may issue a ROW Grant, pursuant to Title V of FLPMA (43 USC 1761-1771), for electrical power generation, transmission and distribution systems, systems for the transmission and reception of electronic signals and other means of communications, highways, railroads, pipelines (other than oil and gas pipelines) and other facilities or systems which are in the public interest; and

WHEREAS, in regards to the Undertaking, the ANF and BLM manage historic properties and cultural resources on public land according to the National Historic Preservation Act (NHPA) (P.L. 89-665, as amended), and these have been considered during consultation for this Programmatic Agreement (PA); and

WHEREAS, the ANF has consulted with the California State Historic Preservation Officer (SHPO) about this Undertaking; and

WHEREAS, the ANF has notified and invited the Advisory Council on Historic Preservation (Council) per 36 CFR § 800.6(a)(1)(i)(C) to participate in the consultation to resolve the potential effects of the Undertaking on historic properties and, per its letter dated September 23, 2009, the Council has elected not to participate in this PA; and

WHEREAS, the ANF and BLM, in consultation with the SHPO, have determined that a phased approach for compliance with Section 106 of the NHPA is appropriate for the Undertaking because all effects of the Undertaking on historic properties cannot be known prior to approval of the Project (36 CFR § 800.14(b)(1)(ii)); there is the potential to encounter unanticipated historic properties during the life of the Project (36 CFR § 800.13(a)(1)); and the completion of the identification of historic properties, determinations of specific effects on historic properties, and consultation concerning measures to avoid, minimize, or mitigate any adverse effects shall be carried out as part of planning for and prior to implementing any specific Project activities that have the potential to cause adverse effects on historic properties; and

WHEREAS, per 36 CFR § 800.2(a)(2) the ANF is the lead federal agency for the entire Undertaking, including those components of BRRTP on non-federal land, for the purpose of complying with Section 106 of the NHPA and its implementing regulations at 36 CFR § 800, and the ANF and BLM shall each be responsible for managing historic properties within the Area of Potential Effects (APE) for the Undertaking pursuant to the NHPA under the areas of their individual jurisdictions; and

WHEREAS, LADWP shall consult with the ANF as the lead federal agency for Section 106 regarding the management of archaeological and historical resources outside of the boundaries of ANF and BLM-administered lands; and

WHEREAS, LADWP, a municipal utility and department of the City of Los Angeles, is the lead agency for compliance with the California Environmental Quality Act (CEQA) (California Public Resources Code (PRC), Division 13, Sections 21000-21177, as amended) and has certain responsibilities under state laws and regulations to take into account and mitigate the effects of this Project on historical resources eligible for or listed on the California Register of Historical Resources (California Register) and is coordinating compliance with state law with federal agency responsibilities to comply with Section 106 of the NHPA; and

WHEREAS, LADWP shall have responsibility for carrying out specific terms of this PA and is an Invited Signatory to this PA; and

WHEREAS, the ANF and BLM have consulted (per 36 CFR § 800.3(f)(2); 36 CFR § 800.14(b)(2); and 36 CFR § 800.14(f)) federally-recognized Tribes (i.e., San Manuel Band of Mission Indians, Morongo Band of Mission Indians, The Santa Ynez Band of Mission Indians/Tribal Elders Council, Tejon Indian Tribe); and groups and individuals specifically identified by the California Native American Heritage Commission (NAHC) as having cultural affiliation with the BRRTP area and expressing an interest in the Undertaking and have invited them to participate as Concurring Parties to this PA, with the understanding that, notwithstanding any decision by these Parties to decline to participate as Concurring Parties, the ANF and BLM shall continue to consult with them throughout the implementation of the PA (per 36 CFR § 800.2(c)(5)); and

WHEREAS, in accordance with 36 CFR 800.2 § (c)(5) and 36 CFR § 800.14(b)(2)(ii), the ANF and BLM have consulted with non-federally recognized tribal groups (i.e., Gabrieliño Group, Seven Feathers Corp/San Fernando Band of Mission Indians, Owl Clan Consultants); groups and individuals identified by the NAHC as having cultural affiliation with the BRRTP area; and other tribal groups and individuals known by the ANF as potentially interested parties; and have invited those expressing an interest in the Undertaking to participate as Consulting Parties in the development of the PA;

NOW, THEREFORE, the ANF, BLM, and SHPO (hereinafter "Signatories") and LADWP (hereafter "Invited Signatory") agree that the federal agencies, to the extent of their legal authority, shall administer the Undertaking in accordance with the following stipulations to satisfy the federal agencies' Section 106 responsibilities for this Undertaking.

STIPULATIONS

The ANF and BLM shall ensure that the following measures are implemented.

I. AREA OF POTENTIAL EFFECTS

Because the route for the Undertaking is not yet selected, a final area of potential effects (APE) will be established after the selected transmission line route is identified in the *USDA Forest Service, USDI Bureau of Land Management, and Los Angeles Department of Water and Power Barren Ridge Renewable Transmission Project Final Environmental Impact Statement/Environmental Impact Report* (EIS/EIR) and will include the areas where the Undertaking may directly or indirectly affect historic properties. For the *BRRTP Draft EIS/EIR* (August 2011) and *Cultural Resource Technical Report and Class I and Class II Inventory Report* (September 2010), the study area was equivalent to an APE for each alternative. Upon identification of the final APE, all Signatories will be notified by the ANF.

A single APE (36 CFR § 800.16(d)) for the Project is defined as consisting of the following components:

(A) Prior to and during construction of the BRRTP, the APE within ANF- and BLM-administered lands shall include all areas in which:

  (1) Historic properties could sustain direct effects as a result of the Undertaking and is defined to include:

    (a) The selected alternative for BRRTP identified in the Final EIS/EIR. This would include the proposed 2.7-acre expansion area for the existing Barren Ridge Switching Station north of Mojave; the 5.5-acre site of the proposed Haskell Switching Station in Haskell Canyon north of Santa Clarita; an approximately 61.5-mile 200-foot wide corridor south from the Barren Ridge Switching Station to the proposed Haskell Switching Station; approximately 12 miles of existing corridor between the new Haskell Switching Station and the existing Castaic Power Plant; and approximately 75 miles of the existing Barren Ridge-

Rinaldi (BR-RIN) corridor from the Barren Ridge Switching Station to the Rinaldi Substation in the San Fernando Valley (see Figure 1 in Appendix A and the Construction Phase Management Plan [CPMP] in Appendix C [to be developed]).

(b) Any ancillary Project use areas or facility locations that are outside these corridors and permitted by the ANF or BLM, including but not limited to, marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-arounds/pull outs, guard pole locations, and splicing/pulling set-up areas. A 50-foot wide buffer shall extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer shall extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.

(c) If a historic property extends outside the APE, the APE in that location shall be redefined to include the boundaries of the entire historic property.

(2) Any area within which historic properties could sustain indirect effects, i.e., effects resulting from the Undertaking that are separated in space or time from the Undertaking. This area would include:

(a) For visual effects, land within 3.0 miles of the proposed transmission line, based on information provided in the Visual Resources sections of the Final EIS/EIR;

(b) For this Undertaking, the APE does not include areas of potential atmospheric and auditory effects because such effects would be temporary, occurring over about 6 months, and would not be significant, as determined in the Final EIS/EIR.

(B) Prior to and during construction of the BRRTP, the APE for the selected alternative outside the boundaries of ANF- and BLM-administered lands shall include the following areas:

(1) All areas of the Undertaking in which historic properties could sustain direct effects, defined to include continuous corridors for each linear segment, each a total of 200 feet wide (see Figure 1 in Appendix A and the CPMP in Appendix C [to be developed]).

(2) Any ancillary Project use areas or facility locations that are outside these 200-foot wide corridors, including, but not limited to, marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-arounds/pull outs, guard pole locations, and splicing/pulling set-up areas. A 50-foot wide buffer shall extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer shall extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.

(3) Any areas within which historic properties could sustain indirect effects as a result of the Undertaking (See Stipulation I(A)(2)).

(C) Prior to and during construction, the APE for switching stations (i.e., expansion of the Barren Ridge Switching Station, the proposed Haskell Switching Station) shall be:

(1) The total area of any ground disturbance required for each switching station plus a 100-foot buffer around the area of disturbance; and

(2) Any areas within which historic properties could sustain indirect effects as a result of the Undertaking (see Stipulation I(A)(2)).

(D) Following construction and for purposes of operation and maintenance activities as may be required, the APE for the BRRTP alignment shall be the width of any ROW or easement granted to LADWP by the ANF, BLM or any other party and as memorialized in legally binding agreements among the relevant parties. The APE for switching stations shall be the area of each switching station defined in any easement, deed or other legal definition for the switching station parcel.

II. COORDINATION OF THIS PROGRAMMATIC AGREEMENT WITH THE ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT FOR BRRTP

Compliance with NEPA and with Section 106 of the NHPA can be parallel processes, and the Council encourages federal agencies to coordinate compliance with Section 106 and the requirements of NEPA. Impacts to cultural resource are identified in the *BRRTP Draft EIS/EIR* (2011) and in the confidential appendix to the EIS/EIR entitled *Cultural Resource Technical Report and Class I and Class II Inventory Report* (2010). Mitigation measures identified in the two documents were not resource-specific; rather the documents explained that this PA was being prepared and would set forth procedures for identifying, evaluating, and managing cultural resources along the selected alternative. Resource-specific mitigation measures will be identified in consultation with Signatories and implemented as appropriate following completion of the Class III intensive inventory.

Upon completion of the Final EIS/EIR but prior to the issuance of a NEPA Record of Decision (ROD) and a CEQA Notice of Determination (NOD), the Signatories and Invited Signatory shall commit to implementation of the procedures contained herein for compliance with Section 106 responsibilities for the BRRTP Undertaking. Execution of this PA does not imply commitment by any party to a definite decision regarding the Undertaking prior to completion of the NEPA/CEQA Decision/Determination. If LADWP chooses to, or for any reason the project does, not go forward following the ROD, the USFS and BLM will not have an Undertaking and pursuant to Stipulation XII of this PA shall terminate.

A draft of this PA was circulated for public comment during the commenting period for the Draft EIS/EIR (August 2011). The ANF, BLM, SHPO and LADWP have taken into consideration applicable public comments received regarding the Draft PA in preparing the Final PA. Additionally, ANF has invited federally recognized Tribes, non-federally recognized Tribes, and other parties to provide comments regarding the Draft PA and has consulted with the other Signatories and the Invited Signatory to take into consideration applicable comments received from the Tribes and other parties in preparing the Final PA.

III. MANAGEMENT OF CULTURAL RESOURCES IN THE APE

(A) When managing cultural resources and historic properties per this PA, the CPMP required in Stipulation IV, or the Historic Properties Management Plan (HPMP) required in Stipulation V, LADWP shall conform to the protocol described below.

(B) All lands potentially subject to ground disturbance within the BRRTP APE (as defined in Stipulation I), including those components of the Undertaking whose locations are not yet determined, shall be intensively surveyed for cultural resources except in those cases in which the ANF and BLM agree that intensive survey is not feasible. Non-intensive survey methods will be utilized where conditions prohibit intensive survey methods. Specific identification and evaluation procedures are outlined in the CPMP (Appendix C [to be developed]).

(C) All newly identified and previously recorded cultural resources within the APE that may be adversely affected (36 CFR § 800.5) shall be evaluated for eligibility to the National Register using the criteria at 36 CFR § 60.

  (1) LADWP shall submit to the ANF and BLM in writing its assessment regarding National Register eligibility for each resource within the APE and will identify the National Register criteria under which the affected characteristics of each resource are assumed to be historically significant. The ANF and BLM may assume eligibility of the properties for those properties that will be avoided with or without conditions or if adversely affected will respond to LADWP within 30 days to agree or disagree with LADWP's recommendations. Once agencies and LADWP agree on a recommendation, ANF shall provide participating Indian Tribes and Concurring Parties an opportunity to respond within 30 days to the recommendations. The ANF will forward the agencies' recommendations of eligibility to the SHPO for a formal determination of eligibility. The complete record of consultation among the ANF, BLM, SHPO, LADWP and other parties shall be provided to all the Signatories of this PA by ANF within 30 days following any SHPO concurrence or determination of eligibility.

  (2) Should LADWP redesign a component of the Project to avoid a cultural resource, LADWP may provide documentation (36 CFR § 800.4(d)(1)) to the ANF and BLM demonstrating that the potential for adverse effects to that resource has been eliminated through redesign and that National Register eligibility evaluation of the resource may no longer be necessary. The ANF and BLM will respond to LADWP within 10 working days to agree or disagree with LADWP's assessment. If LADWP receives an objection to its assessment that evaluation of eligibility is no longer necessary, it will proceed with the evaluation.

(D) For each cultural resource that has been determined eligible to the National Register, LADWP shall submit to the ANF and BLM a proposed plan to treat (mitigate) the adverse effects of the Project on the affected cultural resource. If a treatment plan is submitted separately from LADWP's recommendation of eligibility, the ANF and BLM shall respond in writing to LADWP within 30 days of receipt of LADWP's treatment plan. ANF and BLM shall provide Indian Tribes, Concurring Parties, and interested groups and individuals an opportunity to comment on the treatment plan. The ANF will consolidate the responses and forward them to all parties. LADWP will revise the treatment plan, if necessary, taking into account the comments received. If the ANF and BLM concur with the revised treatment plan, the ANF will forward the treatment plan to the SHPO for comment or concurrence. The ANF shall take into account any comments received from the SHPO regarding a treatment plan and direct LADWP to make such changes to the plan as the ANF, in consultation with the BLM, deems appropriate.

  (1) The ANF has the authority to determine how any resource on ANF lands will be managed should the SHPO not respond within the allotted time. The BLM has the authority to determine how any resource on BLM-administered lands will be managed should the SHPO not respond within the allotted time.

  (2) Any treatment plan proposed by LADWP may allow for a phased approach to treatment so that if LADWP believes that National Register eligibility is not supported by data or other information recovered during an initial phase of study, LADWP may again consult with the Signatories, seeking concurrence that the cultural resource is, in fact, not

National Register eligible or that an alternative treatment of adverse effects is more appropriate. Any revision or amendment to a treatment plan shall follow the same protocol for concurrence by the ANF and BLM as for the original treatment plan.

IV. CONSTRUCTION PHASE MANAGEMENT PLAN

This PA provides for the preparation and implementation of a Construction Phase Management Plan (CPMP), which will define procedures for the management of historic properties before and during the construction phase of BRRTP, and a Historic Properties Management Plan (HPMP) (Stipulation V), which will define procedures for the management of historic properties during the future operations and maintenance phase of the Project. The construction phase is defined to include Section 106 compliance activities implemented before and during construction of BRRTP.

(A) The CPMP will be prepared by LADWP and before implementation it will be approved by the Signatories and reviewed by Concurring Parties. The Draft CPMP will be made Appendix C (to be developed) of this PA. The CPMP for the Undertaking will detail a historic preservation program to:
(1) Identify potential historic properties in the APE;
(2) Evaluate cultural resources for eligibility for inclusion in the National Register that would be potentially affected by localized components of the Undertaking;
(3) Determine ways to avoid, minimize, or mitigate adverse effects on historic properties within the APE;
(4) Manage previously unidentified archaeological or historic sites discovered during construction of the BRRTP;
(5) Consult and coordinate with government agencies and Indian Tribes with regard to implementation of the CPMP;
(6) Provide for curation of archaeological and historical items associated with the historic preservation program for the Undertaking;
(7) Define the roles and responsibilities of the ANF, BLM, and LADWP in any management of historic properties in the APE.
(8) In order to ensure the proper treatment of Native American human remains and associated grave items, and to comply with the Native American Graves Protection and Repatriation Act (NAGPRA) (P.L. 101-601) and implementing regulations at 43 CFR § 10, the CPMP shall include a NAGPRA Plan of Action (POA) prepared in consultation with the Tribes and other interested Native American groups.

(B) Disposition of recovered cultural materials (archaeological and historic items) discovered prior to and during construction of the BRRTP will be determined through consultation between Signatories, Indian Tribes, Concurring Parties, and interested parties, with their ultimate disposition determined by the Federal Land Managing Agency or Landowner where the find or item was discovered, pursuant to 16 USC 470cc (b)(3) and its implementing regulations (36 CFR § 79.2(b)(2)).

(C) ANF and BLM shall implement the CPMP required to manage historic and unevaluated properties within the APE on lands administered by the ANF and the BLM and on other lands. The CPMP, including National Register evaluation, determination of effects, review, and consultation processes, may be completed in phases and by task. The CPMP shall provide sufficient flexibility to permit Notices to Proceed for portions of the Undertaking on a phased (tiered) basis.

(D) Should any Signatory, the Invited Signatory or a Concurring Party determine that changes to the agreed upon CPMP are warranted to modify existing elements, or to add or delete some elements, of the historic preservation program defined by the CPMP, all the Signatories and the Invited Signatory to the PA shall consult to make changes. The ANF shall then consult in writing with the SHPO and Concurring Parties to determine if the proposed changes constitute a significant revision of the historic preservation program. The SHPO and Concurring Parties will have 45 days to respond in writing to the proposed changes to the CPMP. If the Signatories and Concurring Parties concur that the proposed changes do not constitute a significant revision to the CPMP, or if the SHPO does not respond within 45 days, then the ANF, BLM and LADWP will proceed to revise and implement the appropriate elements of the CPMP. Should any Signatory or the Invited Signatory object to the proposed changes to the CPMP, the objecting parties will proceed according to Stipulation X of this PA.

LADWP shall describe any revision to the CPMP, whether determined significant or insignificant, in its annual Historic Preservation Compliance Report (HPCR) as required in Stipulation VII(B).

V. HISTORIC PROPERTIES MANAGEMENT PLAN

The purpose of the HPMP will be to direct the management of historic properties in the post-construction operations and maintenance phase of the BRRTP. LADWP shall notify the ANF of the date when construction is deemed to have been completed and operations and maintenance begins for each Project component.

(A) LADWP shall develop the HPMP for the Undertaking detailing a historic preservation program to:
   (1) Manage previously unidentified archaeological or historic sites discovered during operation and maintenance of the BRRTP;
   (2) Consult and coordinate with government agencies and Indian Tribes with regard to implementation of the HPMP;
   (3) Support interpretation of historic properties to the public and other public involvement in historic preservation; and define the roles and responsibilities of the ANF, BLM, and LADWP in any long-term management of historic properties in the APE.
   (4) Provide for curation or disposition of archaeological and historical items in accordance with the historic property preservation program for the Undertaking; disposition of recovered cultural materials discovered during operations and maintenance of the BRRTP will be determined through consultation between Signatories, the Invited Signatory, Indian Tribes, Concurring Parties, and interested parties, with their ultimate disposition determined by the Federal Land Managing Agency or Landowner where the find or item was discovered, pursuant to 16 USC 470cc(b)(3) and its implementing regulations (36 CFR § 79.2(b)(2)).

(B) The HPMP shall address, at a minimum and in appropriate detail, the elements defining the long-term historic preservation program during operations and maintenance activities for BRRTP. The HPMP may include provisions for the programmatic treatment of adverse effects to historic properties that could potentially occur as a result of operations and maintenance of the transmission line and related facilities (e.g., pole replacement, road grading). The HPMP shall include a NAGPRA POA, as described in Stipulation IV(A)(8).

The HPMP will be written and organized in a manner so that sensitive information regarding historic properties is kept confidential (see Section 304 of the NHPA; Section 9 of the Archaeological Resources Protection Act (ARPA); Executive Order 13007, Indian Sacred Sites; California Government Code, Chapter 3.5, Section 6354.10; and access agreements with the California Historical Resource Information System (CHRIS)).

(C) The HPMP may be prepared by LADWP as a single document addressing all components of the BRRTP or may be completed in phases and by task. Any version of the HPMP shall be prepared and circulated for review as defined below in Subsection (C)(1-4) of this Stipulation. If the HPMP is prepared incrementally, by phase or by task, LADWP shall first prepare a basic HPMP that defines the general principles and procedures LADWP will follow in the management of historic properties and unevaluated resources as outlined in Subsection (A)(1-4) of this Stipulation. The HPMP will then be supplemented for each BRRTP component by specific management prescriptions for each historic property and unevaluated resource.

(1) Not less than 60 days prior to the estimated date of completing construction on the first BRRTP segment, an Administrative Draft HPMP shall be prepared and submitted by LADWP to the ANF and BLM for review and comment. Within 30 calendar days following receipt, the ANF and BLM will provide written comments to LADWP and direct LADWP to make revisions. The resulting document will be the Draft HPMP.

(2) The ANF shall distribute the Draft HPMP to the BLM, SHPO, and Concurring Parties for review and comment. Reviewers of the Draft HPMP will have 30 calendar days from date of receipt to provide their written comments to the ANF.

(3) The ANF will take into account comments received from the BLM, SHPO, and Concurring Parties and will direct LADWP to make appropriate changes in the Draft HPMP. LADWP shall submit a revised HPMP to the ANF and BLM within 90 calendar days of receipt of the ANF's directive to make changes. Upon acceptance by the ANF and the BLM, the resulting document will be considered the Final HPMP. The Final HPMP shall be provided to the Signatories within 10 working days of receipt from LADWP by the ANF of an acceptable Final HPMP. The ANF, BLM, and SHPO shall indicate their acceptance of the Final HPMP in letters of concurrence.

(4) The ANF shall notify the Concurring Parties that the Final HPMP has been completed. The ANF shall, within 30 calendar days of the ANF's, BLM's, and SHPO's acceptance of the Final HPMP, provide copies of the Final HPMP to the Concurring Parties.

Should any Signatory, the Invited Signatory or a Concurring Party object to the content of the Draft or Final HPMP, the ANF shall proceed to resolve the objection(s) consistent with Stipulation X, below.

(D) A Historic Preservation Compliance Report (HPCR) shall be prepared consistent with Stipulation VII(B), below. LADWP shall describe any revision to the HPMP, whether determined significant or insignificant, in its annual HPCR.

(E) Should any Signatory, the Invited Signatory or a Concurring Party determine that changes to the HPMP are warranted, the ANF shall consult with the BLM, SHPO, LADWP, and Concurring Parties to make the agreed upon changes. Should any Signatory or Invited Signatory object regarding proposed changes to the HPMP, the objecting parties will proceed according to Stipulation X of this PA.

VI. NATIVE AMERICAN CONSULTATIONS

The ANF and BLM shall continue to consult with Indian Tribes and other Native American groups and individuals as follows.

(A) The ANF and BLM shall consult with Indian Tribes per NHPA, ARPA, American Indian Religious Freedom Act (AIRFA), and NAGPRA, applicable regulations (e.g., 36 CFR § 296 and 43 CFR § 10), and applicable Executive Orders (e.g., 13007 and 13175). Cultural items subject to NAGPRA shall be managed according to applicable provisions of NAGPRA.

(B) The ANF has consulted with the BLM and California NAHC to develop a list of Tribes, organizations, groups, and individuals (Most Likely Descendents) that have been and shall continue to be consulted regarding BRRTP. This list will be updated at least every 2 years following execution of this PA or until the HPMP has been executed. The consultation list will be used by the ANF for all Native American consultations.

(C) Indian Tribes, groups, organizations and individuals consulted by the ANF shall be, at a minimum, those identified by the California NAHC; and Indian Tribes recognized by the Secretary of the Interior per 36 CFR §§ 800.2(c)(2800.3(f)(2), 800.14(b)(2), 800.14(f)), and as interested parties per 36 CFR § 800.2(c)(5)).

(D) Although the ANF shall act as the lead federal agency for government-to-government consultation pertaining to the Undertaking on ANF and BLM-administered lands, the ANF and BLM shall not delegate their government-to-government consultation responsibilities pertaining to the Undertaking. The ANF will be responsible for keeping the administrative record of all Indian Tribe consultation regarding the Undertaking and shall share that record with the other Signatories, the Invited Signatory and Concurring Parties, as requested.

VII. REPORTING

(A) LADWP shall submit draft reports of any cultural resource work undertaken pursuant to this PA to the ANF and BLM within 60 days of completion of fieldwork unless otherwise agreed to by the ANF, BLM, and LADWP. Reports for historic properties that cannot be avoided will include management recommendations that may include, but not be limited to, avoidance and mitigation measures, monitoring, data recovery methods, and long-term management goals. LADWP will distribute draft reports to the ANF, BLM and Concurring Parties for their review and comment subject to Stipulation XIII (Confidentiality of Records and Information). The ANF, BLM and any Concurring Party will have 30 days of receipt of any report to comment. ANF will consolidate comments and request LADWP to address ANF, BLM, or other Parties' comments and make the desired changes or revisions. Any draft reports pertaining to the evaluation of National Register significance or treatment of historic properties shall be provided to the SHPO by the ANF for comment within 30 days of receipt. The ANF will share any comments with the other Signatories and direct LADWP to prepare either a revised draft report or a final report to be submitted to the ANF within 60 days unless otherwise agreed to by the ANF and LADWP. Reports will be submitted electronically unless otherwise stipulated by the ANF. The number of hard copies to be submitted will be determined by the ANF. Any extensions to complete reports must be approved by the ANF. Copies of all final reports prepared during a calendar year will be submitted to all Signatories with the annual HPCR.

(B) ANF shall direct LADWP to compile a HPCR of cultural resource management activities conducted pursuant to this PA. A Draft HPCR shall be provided to the ANF by LADWP not less than 30 days prior to the anniversary date of the execution of this PA, and the LADWP will distribute the Draft HPCR to the ANF, BLM and Concurring Parties for comment. The Signatories and Concurring Parties will have 30 days of receipt of the Draft HPCR to comment. ANF will consolidate Signatory and Concurring Party comments and direct LADWP to address their comments and make the desired changes or revisions. An HPCR will be required of LADWP annually for the first 5 years following completion of construction on all components of the Project. After 5 years the reports will be filed every 3 years unless the ANF directs otherwise.

The HPCR shall, at a minimum, report the following management activities in sufficient detail to allow the ANF, BLM and SHPO to determine that all terms and provisions of the PA have been carried out in the reporting year regarding efforts to:

(1) Inventory, evaluate, manage, and treat adverse effects to historic properties within the APE;
(2) Consult and coordinate with government agencies and Tribes with regard to implementation of the HPMP;
(3) Provide for curation of archaeological and historical items associated with the historic preservation program for the Undertaking, to include the curation or disposition status of any archaeological or historic items recovered during the preceding year’s cultural resource management activities;
(4) Support interpretation of historic properties to the public and other public involvement in historic preservation; and
(5) Any other activities as required of LADWP by the ANF and BLM to comply with this PA.

ADMINISTRATIVE STIPULATIONS

VIII. STANDARDS

(A) ***Professional Qualifications***: All actions prescribed by this PA that involve the identification, evaluation, analysis, recordation, treatment, monitoring, and disposition of historic properties and that involve the reporting and documentation of such actions in the form of reports, forms or other records, shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the *Secretary of the Interior's Professional Qualifications Standards* (PQS) for archaeology, history, or architectural history, as appropriate (48 FR 44739). However, nothing in this stipulation may be interpreted to preclude any party qualified under the terms of this paragraph from using the services of properly supervised persons who do not meet the PQS.

(B) ***Curation and Curation Standards:*** To the extent permitted under California PRC § 5097.98 and § 5097.991, the materials and records resulting from the actions cited in Subsection (A) of this stipulation and located on non-federal lands shall be managed and curated in accordance with 36 CFR § 79. Where federal lands are involved, all records and materials resulting from the actions cited in Subsection (A) of this stipulation shall be curated in accordance with 36 CFR § 79 and the provisions of NAGPRA (43 CFR § 10) as applicable. Unless otherwise agreed to and stipulated in the HPMP, ANF, BLM and LADWP will attempt to have all collections curated at one location appropriate to each county. If cultural materials are recovered from private lands, ANF and BLM will seek to have the materials donated through a written donation agreement to be curated with other cultural materials. Native American human remains, and items identified as funerary objects, sacred objects, and objects of cultural patrimony (per 43 CFR § 10.2(d)) will be treated pursuant to a Plan of Action (POA) developed in accordance with NAGPRA (P.L. 101-601; USC 3001-3013; 104 STAT. 3048-3059) and its implementing rules and regulations (43 CFR § 10); and included in the CPMP and HPMP, which will be developed and implemented in consultation with Indian Tribes, the Most Likely Descendant and landowner and consistent with state and federal legal requirements.

If any human remains are discovered in the course of the Undertaking, the preferred course of treatment will be identified as provided for in the CPMP and HPMP, in consultation with the Most Likely Descendant and landowner and consistent with state and federal legal requirements.

(C) ***Documentation Standards:*** Reporting on and documenting the actions cited in Subsection (A) of this stipulation shall conform to every reasonable extent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44740); the California Office of Historic Preservation's Preservation Planning Bulletin Number 4(a) December 1989, *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format for the Preparation and Review of Archaeological Reports*; the BLM Manual, MS-8100, *The Foundations for Managing Cultural Resources*; terms of BLM Cultural Resource Use Permits and field authorizations, Forest Service Manual 2360, *Heritage Program Management*; terms of Forest Service permits and field authorizations; and any specific county or local requirements or report formats as necessary.

IX. COSTS

LADWP shall bear the expense of identification, evaluation, and treatment of all cultural properties directly or indirectly affected by BRRTP-related activity to the extent that such properties are affected by the Project. Such costs will include, but not be limited to, pre-field planning, field work, post-field analysis, research, preparation of reports (including draft and final versions), and costs associated with curation of Project-related documentation and artifact collections.

X. RESOLVING OBJECTION

(A) Should any of the Signatories or the Invited Signatory to this PA object, at any time, to the manner in which the terms of this PA are implemented, they will make the objection to the ANF. The ANF shall immediately consult with other Signatories and the Invited Signatory to resolve the objection within 30 days. If the Signatories and the Invited Signatory resolve the objection, the ANF may authorize the disputed action to proceed in accordance with the terms of such resolution.

(B) If, at the end of the 30 day consultation period, the Signatories and the Invited Signatory determine that the objection cannot be resolved through such consultation, the ANF shall forward all documentation relevant to the objection to the Council pursuant to 36 CFR

§800.2(b)(2). Any comments provided by the Council will be taken into account by the Signatories and Invited Signatory in reaching a final decision regarding the objection. The ANF shall have the authority per the NHPA to make the final decision resolving the objection if the objection pertains to historic properties in the APE affected by the Undertaking, except for lands administered by the BLM, in which case the ANF shall receive prior written approval of the BLM. The ANF, as appropriate, shall notify the SHPO, BLM, Council, and LADWP in writing of its final decision within 14 days after it is rendered.

(C) The Signatories' and the Invited Signatory's responsibility to carry out all other actions under this PA that are not the subject of the objection will remain unchanged.

(D) At any time during implementation of the terms of this PA, should a written objection pertaining to the PA be raised by a Concurring Party, the ANF shall immediately notify the Signatories, Invited Signatory, and Concurring Parties, all of whom may offer comments. The ANF shall consult with the objecting party for a period of no more than 30 days from the date of the objection. Within 14 days following closure of consultation, the ANF shall notify all parties of its decision regarding the objection in writing. In reaching its final decision the ANF, subject to BLM approval on BLM-administered land, shall take into account all comments from the parties regarding the objection. Any dispute pertaining to the National Register eligibility of cultural resources covered by this PA shall be addressed by the Signatories and the Invited Signatory pursuant to 36 CFR § 800.4(c)(2). The Signatories shall determine if Subsections (A) and (B) of this stipulation shall be implemented to resolve a dispute regarding the eligibility of such historic properties or cultural resources.

XI. AMENDMENTS

(A) Any Signatory, Invited Signatory or Concurring Party to this PA may at any time propose amendments, whereupon all Signatories and the Invited Signatory shall consult among each other to consider such amendments pursuant to 36 CFR § 800.6(c)(7) and § 800.6(c)(8). This PA may be amended only upon written agreement of all the Signatories and Invited Signatory.

(B) The resource treatment delineated in the CPMP (Appendix C [to be developed]) may be amended collectively or by individual resource through consultation with the Signatories, Invited Signatory, and Concurring Parties and agreement by the Signatories and Invited Signatory without requiring amendment of the PA, unless the Signatories and Invited Signatory, through such consultation, decide otherwise.

(C) Amendments to this PA shall take effect on the dates that they are fully executed by the Signatories and Invited Signatory.

XII. TERMINATION

(A) Only Signatories and the Invited Signatory may terminate this PA. If a Signatory or the Invited Signatory proposes to amend this PA, and it is not amended as provided for in Stipulation XI, or if a Signatory or the Invited Signatory proposes termination of this PA for other reasons, the party proposing termination shall notify the other Signatories and the Invited Signatory in writing, explain the reasons for proposing termination, and consult for no more than 30 days to seek alternatives to termination.

(B) Should such consultation result in a written agreement on an alternative to termination, the Signatories and the Invited Signatory shall proceed in accordance with that agreement.

(C) Should such consultation not result in a written agreement resolving the Signatory's or Invited Signatory's concerns, the party proposing termination may terminate this PA by promptly notifying the other Signatories and the Invited Signatory in writing.

(D) Should this PA be terminated, then the Signatories and Invited Signatory shall either consult in accordance with 36 CFR § 800.14(b) to develop a new Agreement or request the comments of the Council. The Signatories and Invited Signatory will include Concurring Parties in the consultation.

(E) Beginning with the date of termination, the Signatories and Invited Signatory shall ensure that until and unless a new PA is executed for the actions covered by this PA, such Undertaking shall be reviewed individually in accordance with 36 CFR § 800.4-800.6 and, depending upon the nature of the action, according to applicable state law.

(F) Any Signatory, Invited Signatory or Concurring Party may terminate its participation in the PA if its roles and responsibilities originally assigned under this PA are no longer appropriate or necessary, by agreement of the Signatories. The PA will otherwise continue in full force and effect following the departure of any party unless the Signatories and Invited Signatory decide otherwise.

XIII. CONFIDENTIALITY OF RECORDS AND INFORMATION

The Signatories and the Invited Signatory shall maintain the confidentiality of records and information pertaining to the location, character, or ownership of archaeological sites and historic properties consistent with NHPA Section 304, ARPA Section 9, and California Government Code 6254.10, as applicable. For National Register resources, the ANF and BLM may determine that certain records and files are appropriate to distribute to parties outside the agency.

XIV. ANNUAL MEETINGS

The Signatories and the Invited Signatory agree to meet annually, beginning one year from the date of the execution of this PA, to discuss implementation of this PA and other items of mutual interest if such a request is made by one of the Signatories or the Invited Signatory. These meetings may coincide with delivery of the HPCR and may occur by teleconference or in-person at the discretion of the Signatories and the Invited Signatory.

XV. DURATION OF THIS PROGRAMMATIC AGREEMENT

Unless this PA is terminated pursuant to Stipulation XII above, another agreement executed for the Undertaking supersedes it, or the Undertaking itself has been terminated, this PA shall remain in full force and effect until ANF, in consultation with the other Signatories and the Invited Signatory, determines that all aspects of the Undertaking have been completed and that all terms of this PA and any subsequent tiered agreements have been fulfilled in a satisfactory manner. Upon a determination by ANF that all aspects of the Undertaking have been completed and that all terms of this PA and any subsequent tiered agreements have been fulfilled in a satisfactory manner, ANF shall notify the other Signatories, the Invited Signatory and Concurring Parties of this PA in writing of the agency's determination. This PA will terminate and have no further force or effect on the day that ANF so notifies the other Signatories and the Invited Signatory to the PA.

This PA will expire if the Undertaking or the stipulations of this PA have not been implemented within five (5) years from the date of its execution. At such time, and prior to work continuing on the Undertaking, the ANF shall either execute a Memorandum of Agreement (MOA) pursuant to 36 CFR § 800.6(c), or request, take into account, and respond to the comments of the Council per 36 CFR § 800.7(c)(4). Prior to such time, the ANF may consult with the other Signatories, the Invited Signatory, and Concurring Parties to reconsider the terms of the PA and amend it in accordance with Stipulation XI above. The ANF shall notify the Signatories, the Invited Signatory, and Concurring Parties as to the course of action it will pursue within 30 days.

This PA expires 50 years from its effective date unless extended by written agreement of the Signatories and Invited Signatory. The Signatories and the Invited Signatory shall consult at year 10 to review this PA. Additionally, the Signatories and the Invited Signatory shall consult not less than one year prior to the expiration date to reconsider the terms of this PA and, if acceptable, have the Signatories and the Invited Signatory extend the term of this PA. Reconsideration may include continuation of the PA as originally executed or amended, or termination. Extensions are treated as amendments to the PA under Stipulation XI.

XVI. EFFECTIVE DATE

This PA and any amendments will take effect on the date that it has been fully executed by the Signatories and the Invited Signatory. The PA and any amendments thereto shall be executed in the following order: (1) LADWP, (2) BLM, (3) ANF, and (4) SHPO. Execution and implementation of this PA is evidence that the ANF and BLM have afforded the Council a reasonable opportunity to comment on the Undertaking and its effects on historic properties. The Signatories and the Invited Signatory to this PA represent that they have the authority to sign for and bind the entities on behalf of whom they sign.

SIGNATORIES:

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE -- ANGELES NATIONAL FOREST

By: ______________________________ Date: ________________

Thomas A. Contreras
Forest Supervisor

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT

By: ____ Date: ________________________

Carl Symons
Acting Field Manager, Ridgecrest Field Office

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: ____ Date: ________________________
Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

INVITED SIGNATORY:

LOS ANGELES DEPARTMENT OF WATER AND POWER

By: ______________________________ Date: ____________________

Mark Sedlacek
Director of Environmental Affairs, LADWP

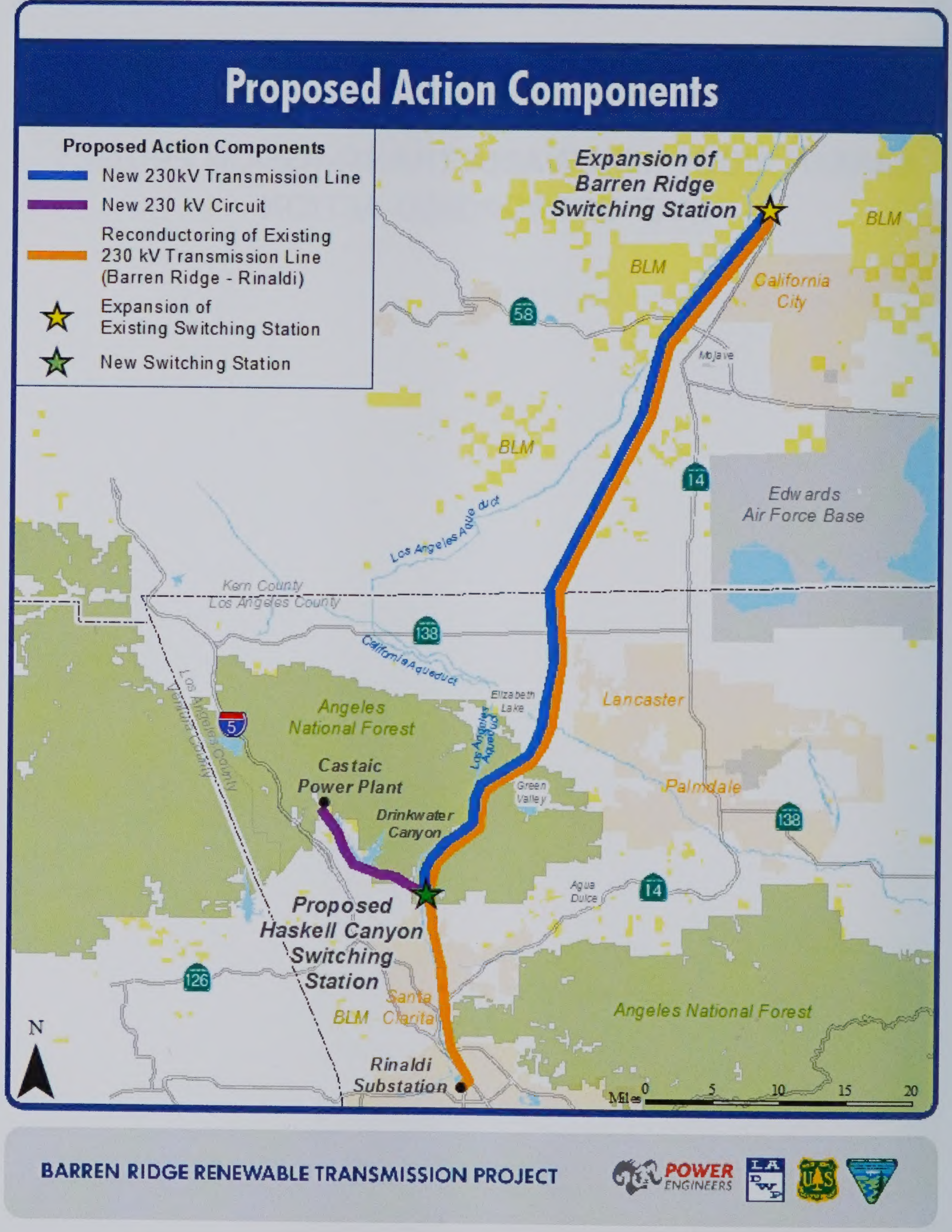
CONCURRING PARTIES

By: ____ Date: ________________________

APPENDIX A

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT MAP OF PROPOSED ACTION

Figure 1. Proposed Action


Proposed Action Components
Proposed Action Components
New 230kV Transmission Line
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
BLM
BLM
California City
58
Mojave
BLM
14
Edwards Air Force Base
Los Angeles Aqueduct
Kern County
Los Angeles County
138
California Aqueduct
Elizabeth Lake
Lancaster
Los Angeles County
Ventura County
5
Angeles National Forest
Los Angeles Aqueduct
Castaic Power Plant
Green Valley
Palmdale
Drinkwater Canyon
138
Agua Dulce
14
Proposed Haskell Canyon Switching Station
126
Santa Clarita
BLM
Angeles National Forest
N
Rinaldi Substation
Miles 0 5 10 15 20
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LA DWP

APPENDIX B

DEFINITIONS

DEFINITIONS

The definitions found at 36 CFR § 800.16 apply throughout this PA except where another definition is offered in this PA.

Concurring Party. A party who signs this Agreement, but is not legally or financially responsible for completion of stipulations. Concurring Parties may volunteer to assist with implementation of stipulations and may propose amendments to the PA; however, Concurring Parties cannot terminate the Agreement. Amendments proposed by Concurring Parties may be considered at the discretion of the Signatories.

Consulting Party. Certain individuals and organizations with a demonstrated interest in the Undertaking may participate as Consulting Parties due to the nature of their legal or economic relations to the Undertaking or affected properties, or their concern with the Undertaking's effects on historic properties (per 36 CFR 800.2 § (c)(5)).

Cultural Resource. A cultural resource is an object or place of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and places of traditional cultural or religious importance to specified social or culture groups. Cultural resources include the entire spectrum of resources, from artifacts to cultural landscapes, without regard to eligibility for listing in the National Register.

Historic Property. Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register maintained by the Secretary of the Interior and per the eligibility criteria at 36 CFR § 60.4. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural significance to an Indian Tribe that meet the National Register criteria. The term *eligible for inclusion in the National Register* includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

Historical Resource. Under the California Environmental Quality Act (CEQA), a historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources; a resource included in a local register of historical resources; or an object, building, structure, site, area, place, record, or manuscript which a CEQA lead agency determines to be historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence (California Code of Regulations, Title 14, Division 6, Chapter 3 Section 15064.5).

Indian Tribe. An Indian Tribe, band, nation, or other organized group of community . . . which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians (36 CFR § 800.16(m)).

Invited Signatory. A party invited by the agency official to be a Signatory to this Agreement. Any such party that signs the Agreement shall have the same rights with regard to seeking amendment or termination as the other Signatories. The Invited Signatory for this Agreement is LADWP.

Lands Administered by the ANF means any federal lands under the administrative authority of the U.S. Department of Agriculture Forest Service, Angeles National Forest (ANF).

Lands Administered by the BLM means any federal lands under the administrative authority of the Department of the Interior Bureau of Land Management, Ridgecrest Field Office (BLM).

Management of Cultural Resources and Historic Properties. The term "management" refers to any historic preservation activity undertaken by any Signatory or Invited Signatory to this PA, including archaeological, historical, ethnographic and other research to identify cultural resources and historic properties; efforts to evaluate and determine the historical significance of any cultural resource and its eligibility for listing in the National Register; efforts to determine the Undertaking's effects on historic properties; designing and implementing measures for the preservation or protection of cultural resources; consultation among the parties to this PA and the public; designing and implementing mitigation measures for unavoidable adverse effects on historic properties; preparation of reports and other documentation of historic preservation efforts; public education; preparation for, and curation of, artifacts, reports, notes, digital data, and other related materials (e.g., per 36 CFR § 79); and any other activity required per this PA or applicable historic preservation law.

Signatory. Signatories are those agencies required by statute to be parties to this Agreement and who, along with the Invited Signatory, have sole authority to execute, amend, or terminate the Agreement. Signatories to this PA are the ANF, BLM and SHPO.

Undertaking. Issuing a permit or granting a ROW individually or collectively by the ANF and BLM and the demolition, construction, operation or maintenance activities for BRRTP on ANF or BLM-administered lands or on other lands constitute an "Undertaking" as defined at 36 CFR § 800.16(y) and is the Undertaking addressed by this PA.

APPENDIX C

DRAFT

CONSTRUCTION PHASE MANAGEMENT PLAN

TO BE DEVELOPED

APPENDIX P: EIS/EIR DISTRIBUTION LIST

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Barren Ridge Renewable Transmission Project
Final EIS/EIR Distribution List

Organization Type	Organization Name	Title	First Name	Last Name	Address	City	State	Zip	Email
CITY	Acton - Agua Dulce Unified School District	Superintendent	Dr. Stan	Halperin	32248 Crown Valley Road	Acton	CA	93510	SHalperin@aadusd.k12.ca.us
Repository	Acton-Agua Dulce Library	Head Librarian			33792 Crown Valley Rd.	Acton	CA	93510	BH33605@aol.com
FED	Advisory Council on Historic Preservation	Director, Planning and Review	Nelson	Reid	1100 Pennsylvania Ave., NW, Suite 809	Washington	DC	20004	
ORG	Agua Caliente Band of Cahuilla Indians	Tribal Historic Preservation Office	Patricia A.	Garcia-Tuck	5401 Dinah Shore Drive	Palm Springs	CA	92264	
ORG	Agua Dulce Town Council	President	Don	Henry	33201 Agua Dulce Canyon Road Box Number 8	Agua Dulce	CA	91390	
ORG	Agua Dulce Civic Association	President	Scott	Griffin	33201-1 Agua Dulce Canyon Rd., #1	Agua Dulce	CA	91390	
COUNTY	Antelope Valley Air Quality Management District	Executive Director	Eldon	Heaston	43301 Division Street, Suite 206	Lancaster	CA	93535	
	Antelope Valley Healthcare District		Les	Wong	1600 West Avenue J	Lancaster	CA	93534	
	Antelope Valley Mosquito and Vector Control District		Cei	Kratz	P.O. Box 1192	Lancaster	CA	93584	
CITY	Antelope Valley Resource Conservation District	Director	Steve	Rodrigues	44811 No. Date Avenue Suite G	Lancaster	CA	93534	avrcd@carcd.org
CITY	Antelope Valley Union High School District	Superintendent	Dr. David	Vierra	44811 Sierra Highway	Lancaster	CA	93534	bettyv@avhsd.org
COUNTY	Antelope Valley-East Kern Water Agency	Contact	Russel E.	Fuller	6500 West Avenue N	Palmdale	CA	93551	
STATE	California Department of Forestry & Fire Protection	Chief	TIM	TURNER	1234 E. Shaw Ave.	Fresno	CA	93710	
STATE	California Environmental Protection Agency Los Angeles		STEVE	BERGER	320 W. 4th. St., Suite 200	Los Angeles	CA	90013	
STATE	California State Clearinghouse				1400 Tenth St	Sacramento	CA	95814	
STATE	California Department of Conservation, Division of Land Resources Protection	Assistant Director	Brian R.	Leahy	801 K Street, MS 18-01	Sacramento	CA	95814-3528	brian.leahy@conservation.ca.gov
STATE	California Department of Fish & Game, South Coast Region	Acting Regional Manager	Ed	Pert	4949 Viewridge Avenue	San Diego	CA	92123	
STATE	California Department of Fish & Game, South Coast Region	Environmental Scientist	Erinn	Wilson					
STATE	California Department of Fish and Game, Central Region	Regional Manager	Bill	Loudermilk	1234 East Shaw Avenue	Fresno	CA	93710	
STATE	California Department of Forestry and Fire Protection	Deputy Director, Resource Management	Bill	Snyder	P. O. Nox 944246	Sacramento	CA	94244-2460	
STATE	California Department of Parks & Recreation, Angeles District	Director	Ruth	Coleman	1925 Vas Virgenes Road	Calabasas	CA	91302-1909	
STATE	California Department of Parks and Recreation	Director	Ron	Krueper	43779 15th Street W	Lancaster	CA	93534-4754	
STATE	California Department of Parks and Recreation, Tehachapi District	Director	Ruth	Coleman	43779 15th Street W	Lancaster	CA	93534-4754	
COUNTY	California Department of Transportation	Environmental Division Chief	Carrie	Bowen	P. O. Box 12616	Fresno	CA	93728-2616	
STATE	California Department of Transportation, District 7	Environmental Planning, District Director	Ron	Kosinski	100 S. Main Street	Los Angeles	CA	90012	
STATE	California Department of Water Resources		Marie	Buric	1416 9th St, Rm 425	Sacramento	CA	95814	
STATE	California Department of Water Resources	State Water Project Operations Division	Holly B.	Cronin	3310 El Camino Ave., LL-90	Sacramento	CA	95821	
STATE	California Department of Water Resources	Deputy Director, Water Resources Planning & Management	Jerry	Johns	P. O. Box 942836, Room 1115-9	Sacramento	CA	94236-0001	
STATE	California Energy Commission		Jim	Bartridge	1516 Ninth Street, MS-46	Sacramento	CA	95814	jbartrid@energy.state.ca.us
	California Public Utilities Commission	Environmental Project Manager	Andrew	Barnsdale	505 Van Ness Avenue	San Francisco	CA	94102-3298	
ELECT	California Senate	Senator	Hon. George	Runner, Jr.	State Capitol, Room 5097	Sacramento	CA	95814	
STATE	California State Lands	Assistant Division Chief, Environmental Planning	Marina	Brand	100 Howe Avenue, Suite 100 South	Sacramento	CA	95825-8202	brandm@slc.ca.gov
STATE	California State Lands Commission	Chief Environmental Planning & Mgmt	Gail	Newton	100 Howe Ave Suite 100 S	Sacramento	CA	95825	
STATE	CALTRANS	IGR/CEQA Program Mgr.	CHERYL J.	POWELL	100 S Main Street, STE. 100	Los Angeles	CA	90012	
CITY	Castaic Lake Water Agency		Marcia	Ward	27234 Bouquet Canion	Santa Clarita	CA	91350	
CITY	Castaic Union School District	Superintendent	James M.	Gibson	28131 Livingtone Avenue	Valencia	CA	91355	info@castaic.k12.ca.us
ORG	Center for Biological Diversity	Biologist/Desert Program Director	Ileene	Anderson	8033 Sunset Blvd. #447	Los Angeles	CA	90046	ianderson@biologicaldiversity.org
ELECT	City of California City	Mayor	David	Evans	21000 Hacienda Blvd.	California City	CA	93505	
ELECT	City of California City Planning Department	Commissioner	Roger D.	Temeuzen	2100 Hacienda Boulevard	California City	CA	93505	CalCityRealtor@aol.com
CITY	City of Lancaster	Interim City Manager	Mark	Bozigian	44933 Fern Avenue	Lancaster	CA	93534	
CITY	City of Lancaster	City Manager	Robert	La Sala	44933 Fern Avenue	Lancaster	CA	93534	
CITY	City of Lancaster	Assistant Planner	Jocelyn	Swain	44933 Fern Avenue	Lancaster	CA	93534	
CITY	City of Lancaster Community Development	Director	Brian	Ludicke	44933 Fern Avenue	Lancaster	CA	93534	
CITY	City of Lancaster Planning Department	Commissioner	Bruce	Macpherson	44933 Fern Avenue	Lancaster	CA	93534	
ELECT	City of Los Angeles	Mayor			200 N. Spring	Los Angeles	CA	90012	
ELECT	City Of Palmdale	Mayor			38250 N. Sierra Hwy.	Palmdale	CA	93550	
CITY	City of Palmdale Planning Department	Director Of Planning	Laurie	Lile	38250 Sierra Highway	Palmdale	CA	93550	llile@cityofpalmdale.org
CITY	City of Palmdale, Planning	Director	Asoka	Herath	38250 Sierra Highway	Palmdale	CA	93550	
CITY	City of Santa Clarita		Sharon	Sorensen	23920 Valencia Blvd, Suite 300	Santa Clarita	CA	91355	
ELECT	City of Santa Clarita	Mayor	Bob	Kellar	23920 Valencia Blvd, Suite 300	Santa Clarita	CA	91355	
CITY	City of Santa Clarita, Community Development	Director	Paul	Brozman	23920 Valencia Blvd, Suite 300	Santa Clarita	CA	91355	
CITY	City of Santa Clarita, Planning	Senior Planner	Fred L.	Follstal	23920 Valencia Blvd, Suite 300	Santa Clarita	CA	91355	
CITY	City of Santa Clarita, Planning	City Manager	Kenneth	Pulskamp	23920 Valencia Blvd, Suite 300	Santa Clarita	CA	91355	
COUNTY	County of Kern Planning Department	Division Chief	Lorelei H.	Oviat	Public Services Building, 2700 M Street, Suite 100	Bakersfield	CA	93301	loreleio@co.kern.ca.us
COUNTY	County of Kern Planning Department	Director	Ted	James	Public Services Building, 2700 M Street, Suite 100	Bakersfield	CA	93301-2370	planning@co.kern.ca.us
COUNTY	County of Kern Roads Department	Road Commissioner	Craig M.	Pope	2700 M Street, Suite 400	Bakersfield	CA	93301-2370	roads@co.kern.ca.us
COUNTY	County of Los Angeles Fire Department	Chief, Forestry Division	John R.	Todd	5823 Rickenbacker Road, Room 123	Commerce	CA	90040	
COUNTY	County of Los Angeles, Department of Parks and Recreation	Director	Russ	Guiney	433 South Vermont Avenue	Los Angeles	CA	90020	info@parks.lacounty.gov
COUNTY	County of Los Angeles, Dept of Public Works				900 S. Fremont Ave	Alhambra	CA	91803	

Barren Ridge Renewable Transmission Project
Final EIS/EIR Distribution List

Organization Type	Organization Name	Title	First Name	Last Name	Address	City	State	Zip	Email
FED	Department of Defense, Edwards Air Force Base	Sustainability Officer	Hank	Rigol	100 E Sparks Drive	Edwards AFB	CA	93536	
ORG	Desert and Mountain Conservation Authority	Chair	Jim	Dodson	4481 North Date Avenue, Suite G	Lancaster	CA	93534	
FED	Federal Aviation Administration, Western-Pacific Region	Regional Administrator			15000 Aviation Blvd.	Lawndale	CA	90261	
FED	Federal Aviation Administration, Western-Pacific Region	Regional Administrator	William C.	Withycombe	PO Box 92007	Los Angeles	CA	90009-2007	
FED	Federal Highway Administration	Resource Office	Randall	Lisa	12300 West Dakota Avenue, Suite 340	Lakewood	CA	90288	
NA	Gabrielino-Tongva Indians Tribal Council	Chair and Secretary	Robert F. & Mathew	Dorame	5450 Slauson Ave., Ste. 151	Culver City	CA	90230-6000	
	Green Valley County Water District		Laura	Vernitti	39520 Calle Cascada	Santa Clarita	CA	91390	
ELECT	Green Valley Town Council	President	Dale	Kimmel	15637 Calle El Capitan	Green Valley	CA	91390-1048	
CITY	Hughs-Elizabeth Lakes Union Elementery School District	Superintendent/Principal	Sandra	Lyon	16633 Elizabeth Lakes Road	Lake Hughes	CA	93532	slyon@lws.lacoe
COUNTY	Kern Council of Governments	Executive director	Ronald	Brummett	1401 19th Street, Suite 300	Bakersfield	CA	93301	
COUNTY	Kern Council of Governments	Assistant director	Darrel	Hildebrand	1401 19th Street, Suite 300	Bakersfield	CA	93301	
COUNTY	Kern County	Director	Ted	James	Public Services Building, 2700 M Street, Suite 100	Bakersfield	CA	93301-2370	
ELECT	Kern County (Board of Supervisors)	District 2, Supervisor	Don	Maben	1115 Truxtun Ave, 5th Floor County Admin Center	Bakersfield	CA	93301-4617	
ELECT	Kern County (Board of Supervisors)	District 3, Supervisor	Mike	Maggard	1115 Truxtun Ave, 5th Floor County Admin Center	Bakersfield	CA	93301-4617	
ELECT	Kern County (Board of Supervisors)	District 5, Supervisor	Michael	Rubio	1115 Truxtun Ave, 5th Floor County Admin Center	Bakersfield	CA	93301-4617	
ELECT	Kern County (Board of Supervisors)	District 1, Supervisor	Raymond	Watson	1115 Truxtun Ave, 5th Floor County Admin Center	Bakersfield	CA	93301-4617	
COUNTY	Kern County Office of Education	Superintendent	Dr. Larry E.	Reider	1300 17th Street, City Centre	Bakersield	CA	93301-4504	lareider@kern.org
COUNTY	Kern County, Department of Parks and Recreation	Director	Robert	Lerude	1110 Golden State Avenue	Bakersfield	CA	93301	parks-web@co.kern.ca.us
COUNTY	Kern County, Roads Department	Engineer II	Brian R.	Blacklock	2700 M Street, Suite 400	Bakersfield	CA	93301-2730	
ORG	Los Angeles Area Chamber of Commerce	President & CEO	Gary L.	Toebben	350 S. Bixel St.	Los Angeles	CA	90017	
COUNTY	Los Angeles County Flood Control Dist. S BY S				500 W Temple St RM 754	Los Angeles	CA	90012	
COUNTY	Los Angeles County Department of Regional Planning	Director Of Planning	James M.	Hartl, AICP	320 W. Temple Street, Room1390	Los Angeles	CA	90012	
COUNTY	Los Angeles Flood Control District				500 W Temple St 754	Los Angeles	CA	90012	
COUNTY	Los Angeles County Parks & Recreation	Park Planner	Jui Ing	Chien	510 S Vermont Ave, Rm 201	Los Angeles	CA	90020	
ELECT	Los Angeles County Supervisor		David	Antonovich	500 W. Temple St. Rm 383	Los Angeles	CA	90012	
COUNTY	Lahontan Regional Water Quality Control Board	Engineering Geologist	Mack	Hakakian	14440 Civic Drive, Suite 200	Victorville	CA	92392	CMitton@waterboards.ca.gov
COUNTY	Lahontan Regional Water Quality Control Board	Senior Water Resources Control Engineer	Cindi	Mitton	14440 Civic Drive, Suite 200	Victorville	CA	92392	CMitton@waterboards.ca.gov
	Lancaster Cemetery District		Barbara	Little	111 East Lancaster Boulevard	Lancaster	CA	93535	
CITY	Lancaster School District	Superintendent	Howard	Sundberg	44711 No. Cedar Avenue	Lancaster	CA	93534	
ELECT	Leona Valley Town Council	President	Suzy	Love	40350 N. 75th St West	Leona Valley	CA	93551-7523	
	Los Angeles City-County Native American Indian Commission		Ron	Andrade	3175 West 6th Street	Los Angeles	CA	90020	
ELECT	Los Angeles County (Board of Supervisors)	District 7, Council Member	Richard	Alarcon	200 N. Spring St., Rm. 425	Los Angeles	CA	90012	
ELECT	Los Angeles County (Board of Supervisors)	District 12, Council Member	Greig	Smith	200 N. Spring St., Rm. 405	Los Angeles	CA	90012	
ELECT	Los Angeles County (Board of Supervisors)	District 3, Supervisor	Zev	Yaroslavsky	500 W. Temple Street, Suite 525	Los Angeles	CA	90012-2713	
COUNTY	Los Angeles County Office of Education	Superintendent	Darline P.	Robles	9300 Imperial Highway	Downey	CA	90242-2813	robles_darline@lacoe.edu
COUNTY	Los Angeles County Parks & Recreation	Environmental Section Head			510 S Vermont Ave Rm 201	Los Angeles	CA	90020	
COUNTY	Los Angeles County Parks & Recreation	Director	Russ	Guiney	510 S Vermont Ave Rm 201	Los Angeles	CA	90020	
COUNTY	Los Angeles County, Department of Public Works	Land Development Division	Toan	Duong	900 S. Fremont Avenue	Alhambra	CA	91803-1331	
COUNTY	Los Angeles County, Department of Public Works	Director/Road Commissioner	Donald L.	Wolfe	P. O. Box 1460	Alhambra	CA	91802-1460	http://dpw.lacounty.gov/General/contact.cfm
COUNTY	Los Angeles County, Department of Regional Planning	Planning Director	Bruce	McClendon	1390 Hall of Records 320 West Temple Street	Los Angeles	CA	90012	dslavin@planning.lacounty.gov
CITY	Los Angeles Department of City Planning	Deputy Director	Gordon	Hamilton	200 No. Spring St. City Hall Rm.525	Los Angeles	CA	90012	
CITY	Los Angeles Department of City Planning	Director	Con	Howe	200 No. Spring St. City Hall Rm.525	Los Angeles	CA	90012	
CITY	Los Angeles Department of City Planning	Deputy Director	Robert A.	Sutton	200 No. Spring St. City Hall Rm.525	Los Angeles	CA	90012	
CITY	Los Angeles Department of City Planning	Deputy Director	Franklin P.	Eberhard	200 No. Spring St. City Hall Rm.525	Los Angeles	CA	90012	
CITY	Los Angeles Department Of Water and Power		Charles	Holloway	111 North Hope Street RM 1044	Los Angeles	CA	900122694	
COUNTY	Los Angeles Regional Water Quality Control Board	401 Certification	Valarie	Carrillo	230 W. 4th Street, Suite 200	Los Angeles	CA	90013	
	Los Angeles World Airports		Kim	Day	P.O Box 92216	Los Angeles	CA	90009	
ORG	Metropolitan Water District of Southern California	Manager, Environmental Planning Team	Deirdre, M.	West	Box 54153	Los Angeles	CA	90054-0153	
COUNTY	Mojave Desert AQMD		Charles	Fryxell	14306 Park Ave	Victorville	CA	92392	
Repository	Mojave Public Library	Head Librarian			16916 State Highway 14 # D2	Mojave	CA	93501	
CITY	Mojave Unified School District	Superintendent	Larry	Phelps	3500 Douglas Avenue	Mojave	CA	93501	
FED	National Marine Fisheries Service, Habitat Conservation Division, Southwest Region				501 West Ocean Blvd., Suite 4200	Long Beach	CA	90802-4213	
NA	Native American Heritage Comm.	Executive Secretary	Larry	Myers	915 Capitol Mall, Rm. 288	Sacramento	CA	95814	nahc@pacbell.net
FED	Natural Resources and Environmental Affairs	MAGTFTC Marine Corps Air Ground Combat Center	Marie	Cottrell	Building 1451, Box 788110	Twentynine Palms	CA	92278-8110	
FED	Natural Resources Conservation Service, USDA	National Environmental Coordinator			P.O. Box 2890, Room 6158-S	Washington	DC	20013-2890	

Barren Ridge Renewable Transmission Project
Final EIS/EIR Distribution List

Organization Type	Organization Name	Title	First Name	Last Name	Address	City	State	Zip	Email
	Newhall County Water District		Karin J.	Russell	P.O. Box 220970	Santa Clarita	CA	91322	
	Newhall Ranch High Country Recreation and Conservation Authority		Larry	Hensley	510 S. Vermont Ave.	Los Angeles	CA	90020	
Repository	Palmdale City Library	Head Librarian			700 East Palmdale Blvd.	Palmdale	CA	93550	
CITY	Palmdale School District	Superintendent	Roger D.	Gallizzi	39139 North 10th Street East	Palmdale	CA	93550	rdgallizzi@psd.k12.ca.us
Repository	Quartz Hill Library	Head Librarian			42018 N. 50th St. W.	Quartz Hill	CA	93536-3509	
	Quartz Hill Water District	General Manager	Chad	Reed	42141 N. 50th Street West	Quartz Hill	CA	93536	
NA	San Fernando Band of Mission Indians	Chairperson	John	Valenzuela	PO Box 221838	Newhall	CA	91322	
NA	San Manuel Band of Misson Indians			Chair	P.O. Box 266	Patton	CA	92369	
NA	Santa Ynez Band of Mission Indians			Chairperson	P.O. Box 365	Santa Ynez	CA	93460	
CITY	Saugus Union School District	Superintendent	Judy	Fish	24930 Avenue Stanford	Santa Clarita	CA	91355	jfish@saugus.k12.ca.us
COUNTY	South Coast Air Quality Management District	Deputy Executive Director	Elaine C.	Chang	28165 Copley drive	Diamond Bar	CA	91765	echang@aqmd.gov
COUNTY	South Coast Air Quality Management District	CEQA Section	Steve	Smith	21865 Copley Drive	Diamond Bar	CA	91765	
COUNTY	Southern California Association of Governments, Planning and Policy Department	Deputy Executive Director	Jim	Gosnell	818 W. Seventh Street, 12th Floor	Los Angeles	CA	90017	
ORG	Southern California Edison	Director, Local Public Affairs, Los Angeles County	Ben	Wong	PO Box 800	Rosemead	CA	91770	
CITY	Southern Kern Unified School District	Superintendent	Rodney	Van Norman	3082 Glendower Street	Rosamond	CA	93560	
STATE	State Office of Historic Preservation	State Historic Preservation Officer	Milford Wayne	Donaldson, FAIA	P.O. BOX 942896	Sacramento	CA	94296-0001	
STATE	State Water Resources Control Board		Kari	Schumaker	1001 I Street	Sacramento	CA	95812	
CITY	Sulphur Springs School District	Superintendent	Dr. Robert	Nolet	17866 Sierra Highway	Canyon Country	CA	91351	bnolet@sssd.k12.ca.us
Repository	Tehachapi Branch Library	Head Librarian			1001 West Tehachapi Boulevard, Suite A-400	Tehachapi	CA	93561	
FED	U.S. Army Corps Of Engineers, LA Dist.	Attention: CESPL-CO-R			P.O. Box 2711	Los Angeles	CA	90053-2325	
FED	U.S. Army Corps of Engineers, Los Angeles District	District Commander	Col. Thomas H.	Magness, IV	915 Wilshire Boulevard, Suite 980	Los Angeles	CA	90017	PublicAfffairs.SPL@usace.army.mil
FED	U.S. Army Engineer Division, South Pacific, CESPD-CMP				333 Market Street, Room 1101	San Francisco	CA	94105-2195	
FED	U.S. Coast Guard, Environmental Protection Division, G-MEP	Environmental Impact Branch Marine			2100 2nd Street, SW	Washington	DC	20593	
FED	U.S. Department of Energy	DIR, Office of NEPA Policy & Compliance			1000 Independence Ave., SW Mail Code EH-42, Room 3E094	Washington	DC	20585	
FED	U.S. Department of Interior	DIR, Office of Env.Policy & Compliance			MS-2340 1849 C ST., NW	Washington	DC	20240	
FED	U.S. Environmental Protection Agency, Region 9	Manager, Environmental Review Office	Kathleen Martyn	Goforth	Mail Code CED-2, 75 Hawthorne Street	San Francisco	CA	94105	
FED	U.S. Fish and Wildlife Service		Della	Snyder	2493 Portola Rd., STE. B	Ventura	CA	93003	
FED	U.S. Fish and Wildlife Service, Ventura Office	Administrative Officer/Division Chief, Administrative & Information Management Division	Deborah	Eidson	2493 Portola Road, Suite B	Ventura	CA	93003	
ELECT	U.S. House of Representatives	Congressman	Kevin	McCarthy	Longworth House Office Building, Room 1523	Washington	DC	20515	
ELECT	U.S. House of Representatives	Congressman	Howard "Buck"	McKeon	Rayburn House Office Building, Room 2351	Washington	DC	20515	
FED	U.S. Navy, Environmental Protection Division	Office of Chief of Navy Operations			ATTN: OP-45	Washington	DC	20350	
ELECT	United States Senate	Senator	Barbara	Boxer	Hart Senate Office Building, Room 112	Washington	DC	20510	
ELECT	United States Senate	Senator	Diane	Fienstein	Hart Senate Office Building, Room 331	Washington	DC	20510	
FED	US DOI	Office of Regional Solicitor	Erica	Niebauer ESQ	2800 Cottage Way RM E1712	Sacramento	CA	95825	
FED	US DOT INS		Gregory	Ward	24000 Avila Rd	Laguna Niguel	CA	92607	
FED	US Environmental Protection Agency	ATSDR	William	Nelson I	75 Hawthorne St STE 100, MS HHS 1	San Francisco	CA	94105	
FED	USDA APHIS PPD/EAD	Deputy Director			4700 River Road, Unit 149	Riverdale	MD	20737-1238	
FED	USDA Forest Service, Angeles National Forest	Acting Forest Supervisor	Marty	Dumpis	701 No. Santa Anita Avenue	Arcadia	CA	91006	
FED	USDA Forest Service, Angeles National Forest	Special Use Coordinator	Justin	Seastrand	701 No. Santa Anita Avenue	Arcadia	CA	91006	
FED	USDA Forest Service, Angeles National Forest	Project Manager	Robert	Hawkins	154 Sherwood Ct.	Vacaville	CA	95687	
FED	USDA Forest Service, Angeles National Forest, Santa Clara Mojave Rivers Ranger District	District Ranger	Bob	Blount	28245 Avenue Crocker, Suite 220	Valencia	CA	91355	
FED	USDA Forest Service, San Bernardino-National Forest	Forest Supervisor	Jeanne	Wade Evans	602 South Tippecanoe Avenue	San Bernardino	CA	92408	
FED	USDA, National Agricultural Library	Head, Acquisitions & Serials Branch			10301 Baltimore Blvd., Room 002	Beltsville	MD	20705	
FED	USDI Bureau of Land Management, California Desert District	NEPA Coordinator	Lynnette	Elser	22835 Calle San Juan De Los Lagos	Moreno Valley	CA	92553	
FED	USDI Bureau of Land Management, Ridgecrest Field Office	Field Office Manager	Hector	Villalobos	300 S. Richmond Road	Ridgecrest	CA	93555	Hector_Villalobos@ca.blm.gov
FED	USDI Bureau of Land Management, Ridgecrest Field Office	Supervisory Geologist	Linn	Gum	300 S. Richmond Road	Ridgecrest	CA	93555	Hector_Villalobos@ca.blm.gov
Repository	Valencia Library	Head Librarian			23743 W. Valencia Blvd.	Santa Clarita	CA	91355	
CITY	West Valley County Water District		Sharon	Jimenez	855 Base Line Road P.O. Box 920	Rialto	CA	92377	
CITY	Westside Union School District	Superintendent	Regina	Rossall	41914 No. 50th Street West	Quartz Hill	CA	93536	
FED	US Dept of the Interior, Office of the Solicitor, MS 5530		Michael C.	Hickey	1849 C St. N.W.	Washington	DC	20240	
FED	Office of the Solicitor, Pacific Southwest Region	Assistant Regional Solicitor	B. Demar	Hooper	2800 Cottage Way RM E1712	Sacramento	CA	95821	
FED	USDI Bureau of Land Management, California State Office		Sandra	McGinnis	2800 Cottage Way Suite W-1623	Sacramento	CA	95825	
FED	USDI Bureau of Land Management, WO-210, Planning & NEPA Branch	Planning & Env. Analyst	Sam	Gaugush	1849 C Street NW, Rm. 5665	Washington	DC	20240	
FED	Denver Library, Denver Federal Center Bldg. 50				P.O. Box 25047	Denver	CO	80225-0047	
CITY	William S. Hart Union High School District	Superintendent	Jaime L.	Castellanos	21515 Centre Points Parkway	Santa Clarita	CA	91350	jcastell@hartdistrict.org

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APPENDIX Q: CONSTRUCTION AVIAN PROTECTION PLAN

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May 2012

LOS ANGELES DEPARTMENT OF WATER AND POWER

Barren Ridge Renewable Transmission Project
Avian Protection Plan

PROJECT NUMBER:
121085

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POWER
ENGINEERS

Barren Ridge Renewable Transmission Project

Avian Protection Plan

PREPARED FOR: LOS ANGELES DEPARTMENT OF WATER AND POWER

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1.0 INTRODUCTION

The following Avian Protection Plan (APP) has been designed to protect resident and migrating avian species that may be placed at risk from construction of the Los Angeles Department of Water and Power's (LADWP) Barren Ridge Renewable Transmission Project (BRRTP, Project). This APP has been developed consistent with the Avian Power Line Interaction Committee's (APLIC) principles of avian protection (APLIC 2005) to support LADWP's commitment to avian safety and compliance with the Migratory Bird Treaty Act of 1918 (MBTA, 16 U.S.C. 703 – 712), the Bald and Golden Eagle Protection Act of 1940 (BGEPA, 16 U.S.C. 668 – 668d), and the Endangered Species Act of 1973, as amended (ESA, 16 U.S.C. 1531 – 1544). It will outline plans, methods, and requirements to ensure that birds are protected during the construction of BRRTP.

Transmission structures present significant dangers to avian species (APLIC 2006). Birds nesting on structures may face increased risk of electrocution and collision if adjacent structures are not avian-safe, or if the area has a high density of existing transmission wires. Nests may also be more susceptible to damage from the elements, especially wind, if they are constructed on open poles, such as those used for distribution lines, or structures without either dense latticework or nesting platforms. Such risks also become costly to the utility company because of the risk of outages due to electrocutions, contact of nesting material with wires, prey falling on live equipment, contamination due to streamers (feces), and collisions with conductors. It is estimated that up to one billion human-related bird fatalities occur each year in the United States (Erickson et al. 2005). Of these, up to 174 million deaths nationwide are estimated to be from electrocutions and collisions with transmission structures (Erickson et al. 2001), hundreds of thousands attributable to the state of California alone (Hunting 2002).

This construction APP has been written with consideration to and guidance from the data and suggestions presented in APLIC's *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* (APLIC 1994), *Avian Protection Plan Guidelines* (APLIC 2005) and *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, existing information on bird use in the Project area has been combined with new Project-specific survey information to effectively address avian safety specific to the construction of BRRTP. The protective measures and methods described in this document are consistent with Project mitigation measures developed for the Project's Environmental Impact Statement/Environmental Impact Report to reduce impacts to migratory birds, bald and golden eagles, and listed avian species.

The following APP does not address the operation and maintenance phase of the Project. An operation and maintenance APP will be developed once the Project has finalized the design on all the project components. The APP will address the protection of resident and migrating avian species that may be placed at risk from the operation and maintenance of the Project and include methods and requirements to ensure that birds are protected during this phase of the Project.

1.1 PROJECT DESCRIPTION

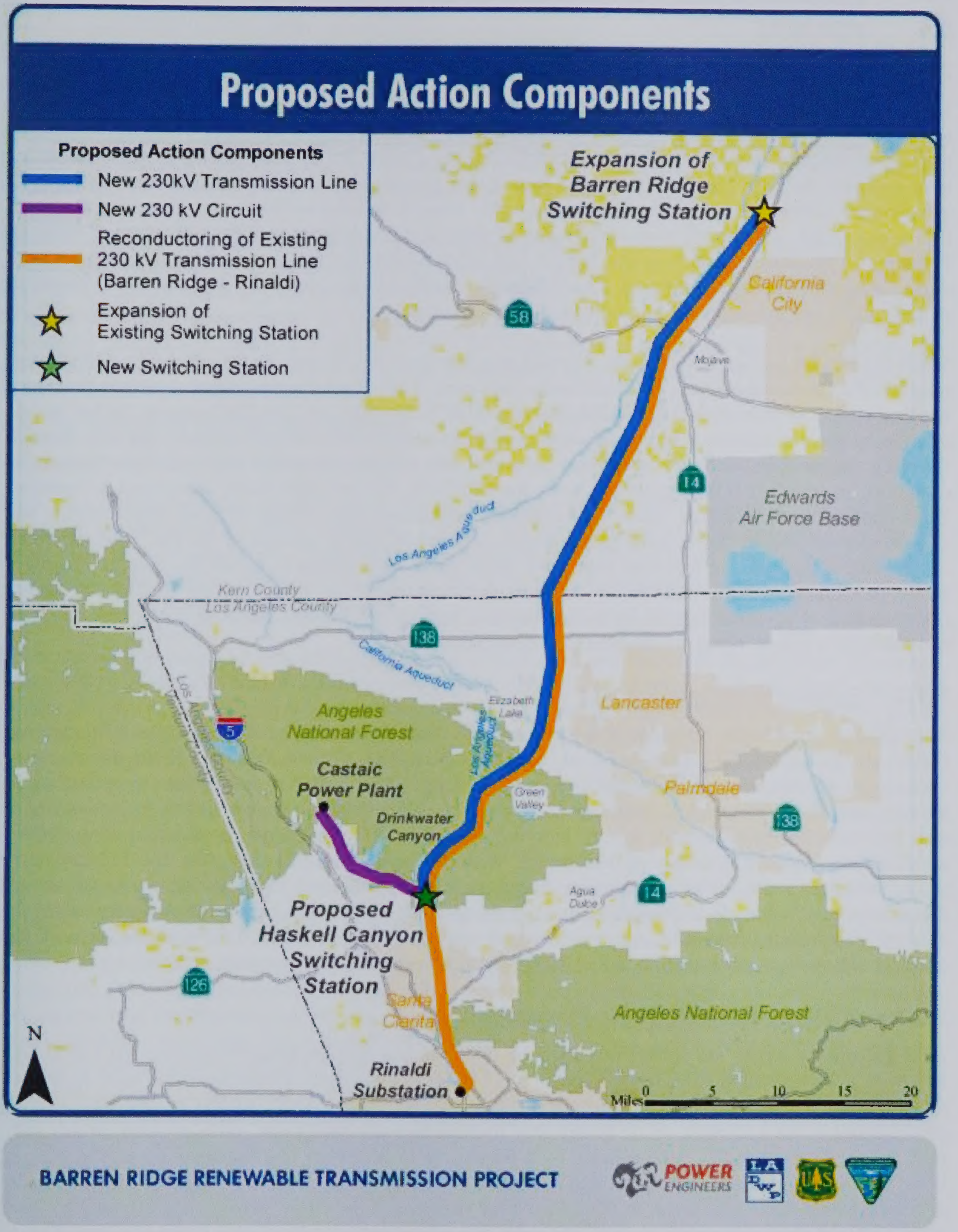
The BRRTP would be located in Kern and Los Angeles counties. As proposed by LADWP, it would be approximately 76 miles in length extending from the Barren Ridge Switching Station to Rinaldi Substation, and extending approximately 12 miles from the Castaic Power Plant to the proposed Haskell Canyon Switching Station (Figure 1). The proposed BRRTP would include the following:

(1) Construction of 61 miles of a new double-circuit 230 kilovolt (kV) transmission line from the Barren Ridge Switching Station to a new switching station located within Haskell Canyon. Approximately 13 miles of National Forest System (NFS) lands, four miles of BLM-managed public lands, and 45 miles of private property would be traversed.

(2) Addition of approximately 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant. Approximately four miles would traverse NFS lands, and 300 feet would traverse BLM-managed lands.

(3) Reconductoring of 76 miles of the existing Barren Ridge-Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and Rinaldi Substation. Approximately 13 miles of NFS lands, four miles of BLM-managed public lands, and 60 miles of private property would be traversed.
(4) Construction of a new switching station in Haskell Canyon.
(5) Expansion of the existing Barren Ridge Switching Station.

FIGURE 1. PROPOSED ACTION MAP


Proposed Action Components
Proposed Action Components
New 230kV Transmission Line
New 230 kV Circuit
Reconductoring of Existing 230 kV Transmission Line (Barren Ridge - Rinaldi)
Expansion of Existing Switching Station
New Switching Station
Expansion of Barren Ridge Switching Station
California City
58
Mojave
14
Edwards Air Force Base
Los Angeles Aqueduct
Kern County
Los Angeles County
138
California Aqueduct
Elizabeth Lake
Los Angeles Aqueduct
Lancaster
Los Angeles County
Ventura County
5
Angeles National Forest
Castaic Power Plant
Drinkwater Canyon
Green Valley
Palmdale
138
Agua Dulce
14
Proposed Haskell Canyon Switching Station
126
Santa Clarita
Angeles National Forest
N
Rinaldi Substation
Miles 0 5 10 15 20
BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
POWER ENGINEERS
LADWP
US

2.0 APPLICABLE LAWS AND REGULATIONS

2.1 FEDERAL

2.1.1. Migratory Bird Treaty Act

In the United States, 836 migratory birds native to the United States or its territories are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code 703-712). The MBTA includes provisions outlined in four separate treaties between the United States and Canada (represented at the time by Great Britain), Mexico, Japan, and Russia that provide for the protection of migratory birds. It prohibits the act of "taking" birds, wherein the word "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect," or to attempt any of these actions, without specific authorization from the Secretary of the Interior. Because the MBTA is a strict liability statute, proof of intent is not required when categorizing a "take" violation. The MBTA also applies to the import, export, shipment, transport, or carrying of any migratory bird or their parts, nests, or eggs.

While the MBTA has no provision for allowing unauthorized take, it must be recognized that some birds may be killed at structures such as transmission lines even if all reasonable avoidance measures have been implemented. The U.S. Fish and Wildlife Service (USFWS) Office of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. While it is not possible under the MBTA to absolve individuals, companies, or agencies from liability if they follow these recommended guidelines, the Office of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals, companies, or agencies who have made good faith efforts to avoid the take of migratory birds. A violation of the MBTA by an individual can result in a fine of up to $15,000 and/or imprisonment of up to six months for a misdemeanor, and up to $250,000 and/or imprisonment for up to two years for a felony. Fines are doubled for organizations.

2.1.2. Endangered Species Act

In addition to the MBTA, some birds in the United States are protected by the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, as amended). The ESA protects federally listed threatened or endangered species and their habitats from unlawful take, where "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." It also prohibits the illegal import, export, carrying, transport, or shipment of any listed species without authorization from the Secretary of the Interior. With a submitted conservation plan, the Secretary may permit exceptions for scientific purposes, the propagation or survival of the affected species, or for instances where "taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Violations of the ESA can result in civil penalties of up to $25,000 for each violation or, for criminal violations, a penalty of up to $50,000 or imprisonment for up to one year, or both.

2.1.3. Bald and Golden Eagle Protection Act

Bald and golden eagles are further protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668C). This prohibits the unlawful take of any bald or golden eagle, where the word "take" is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Taking, participating in the exchange of, or in any way transporting any bald eagle, alive or dead, or any part, nest, or egg of these eagles is punishable by a penalty up to $5,000 or imprisonment up to one year, or both, for the first offense. The second and subsequent offenses are punishable by a penalty up to $10,000 or imprisonment up to two years, or both. First-time violators of the "take" provision above may be fined up to $100,000 and/or imprisoned up to one year, and subsequent violations may result in a fine of up to $250,000 and/or two years imprisonment.

2.2 STATE

2.2.1. California Statutes

In the state of California, birds may be further protected by the California Endangered Species Act (CESA) (California Department of Fish and Game [CDFG] Code Sections 2050-2097); special provisions for take or destruction of bird nests or eggs and, in particular, raptor nests or eggs (CDFG Code Sections 3503-3503.5); state extension of the MBTA and fully protected species clauses (CDFG Code Section 3511-3513); and, to a lesser degree, the California Environmental Quality Act (CEQA) (Public Resources Code 21000-21177). Penalties for violation of these laws vary, but can result in fines of up to $10,000.

CESA provides for the protection of State-listed threatened and endangered species against unlawful take, where "take" means to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." It also prohibits the import, export, possession, or sale of any State-listed species. Exceptions may be granted through authorization by CDFG, or when the United States Secretary of the Interior or Commerce permits take, upon notification of the CDFG director. No exceptions may be granted for the take or possession of fully protected birds except for necessary scientific research or species recovery.

3.0 AVIAN INTERACTION ISSUES

3.1 AVIAN ELECTROCUTIONS

Each year, power line electrocutions cause the death of many large-bodied, vulnerable, and endangered avian species (Sergio et al. 2005). California condors fall into all three of these categories and are the largest bird in the Project area. There are 12 documented cases of California condors being killed by power lines. Ten of these cases were the result of interactions with distribution lines. Only two were from transmission lines (USFWS 2010).

Electrocution may occur because of a combination of biological and electrical design factors (Janss and Ferrer 2001). Biological factors are those that influence avian use of poles, such as habitat, prey, and species. Raptors in particular may be more likely to use poles because they are able to use them for perch-hunting, an energy-saving foraging behavior utilized by many species (APLIC 2006). Raptors and other types of birds will use poles and towers for nesting, especially in open areas or areas with low vegetation where there may not be many natural nesting locations (Bevanger 1994, APLIC 2006). Likewise, there is evidence to suggest that the design of transmission lines and pylons is important in determining the risk of death from electrocution (Janss 2000).

The electrical design factor most crucial to avian electrocutions is the physical separation between energized and/or grounded structures, conductors, hardware, or equipment that can be bridged by birds to complete a circuit (APLIC 2006). Energized components would typically consist of phase conductors, while grounded components could include overhead static wires, neutral conductors, grounding conductors, grounded metal braces, or other pole or tower components. It appears that electrocutions are less common on transmission line towers, because line spacing is at a sufficient distance to lessen the chance of birds completing the electrical circuit (Dorin and Spiegel 2005). High mortality rates are associated with structures that have conductors situated over the crossarms (Janss and Ferrer 2001, Ferrer et al. 1991); Ferrer et al. (1991) found that the least dangerous structures possess insulators below the crossarms. Electrical transmission lines tend to electrocute avian species when the animal touches two conductors, or a positive conductor and a ground, at once, especially if the feather area is wet (Bevanger 1998). Hence, body size and behavior, such as perching and roosting on poles or wires, are the keys to understanding why and how birds become electrocuted. Species frequently affected by electrocution seem to include birds of prey, ravens, and thermal soarers (Bevanger 1998). The majority of raptor electrocutions are caused by power lines that are energized at voltage levels of 69 kV and below, whereas "the likelihood of electrocutions occurring at voltages greater than 69 kV is extremely low" (APLIC 2006).

Electrocutions are largely due to the bird perching on conductors and/or insulators and coming in contact with the energized conductor and grounded insulator base or bonding conductor. While wet feathers may raise the risk of electrocution for a bird by increasing conductivity, dry feathers provide insulation, meaning that in most cases birds are electrocuted when they bridge two energized pieces, or an energized and grounded piece, of equipment with conductive fleshy parts such as the feet, mouth, bill, or wrists (APLIC 2006). Research has demonstrated that skin-to-skin contact is approximately ten times more dangerous to birds than the amperages conducted by contact between conductors and wet feathers, and approximately 100 times more dangerous than the conductivity between conductors and dry feathers (APLIC 2006). Wet feathers can conduct dangerous amperages beginning at around 5 kV, whereas dry feathers require currents greater than 70 kV before they will begin conducting current. High winds increase the problem by reducing the amount of control that birds have over their flight and landing patterns and increasing the risk that they will collide with transmission lines or accidentally bridge two components on a transmission structure and become electrocuted.

3.2 BIRD COLLISIONS

Similar to electrocutions, transmission line collisions are also a major factor in avian mortality along utility corridors. Factors that influence collision risk can be divided into three categories: those related to biology, those related to the environment, and those related to the configuration and location of transmission lines (APLIC 2006, Savereno et al. 1996).

3.2.1. Biological Factors Related to Bird Collisions

Biological factors include habitat use, body size, flight behavior, age, sex, and flocking behavior. In general, construction of transmission lines and structures in ecologically sensitive areas, such as wetlands, should be avoided. Wetlands tend to have a high concentration of birds nesting, feeding, roosting, and migrating back and forth, and add to the collision risk if transmission lines are nearby (Bevanger 1994). Construction in areas within the range of special-status species with a high documented collision risk, such as the California condor, should also be avoided. A total of seven deaths from 1993 to 2001 have been reported by USFWS (2009) as a result of collision with transmission lines. These mortalities were determined to be caused by collision with transmission lines by injury characterization (as determined by necropsy) and proximity to transmission lines. One of these deaths occurred at an existing line that would be adjacent and parallel to the new 230 kV circuit (Gibson 1993).

Many birds, especially raptors, will use transmission poles and towers as perches. This can conserve energy by lowering the amount of time dedicated to flying as the birds search for prey below (APLIC 2006). Bird species that spend an abundance of time in the air may face a greater risk than those that are predominantly ground-based (Bevanger 1994). For example, predators that fly at high speeds when tracking prey, such as peregrine falcons or goshawks (*Accipiter gentilis*), may be more likely to collide with a power line. A bird's flight performance has been shown to be one of the most important factors determining the chances of collision with a transmission line, perhaps more important than the sheer frequency of birds flying near the lines (Janss 2000). Juvenile birds, which are not as familiar with the surrounding area and are less experienced in both flight and, in the case of raptors, hunting methods, can be expected to have greater likelihoods of colliding with transmission lines (Bevanger 1994, Bevanger 1998, Dorin and Spiegel 2005). However, larger birds, such as the California condor, also tend to be more likely to collide with power lines.

3.2.2. Environmental Factors Related to Bird Collisions

Environmental factors influencing collision risk include the effects of weather and time of day for transmission line visibility, surrounding land use practices that may attract birds, and human activities that may flush birds into transmission lines. Overcast weather or thick fog tend to cause birds to lower their flying altitudes. Likewise, headwinds generally cause birds to fly lower, whereas tailwinds may cause birds to fly higher (Bevanger 1994, Perdeck and Speek 1984). High winds may cause some species, especially waterfowl, to fly at lower elevations, increasing collision risk (Hunting 2002). If winds are blowing perpendicular to the wires, this can increase collision possibility even further (Hunting 2002). A previous study of avian migrants found that the lowest daily number of migrants was recorded on a day where the average wind speed was 15.5 miles per hour (mph) (Pope et al. 2006). If wind speeds become too strong, thermal formation may be disrupted, reducing the amount of migration through an area. Additionally, excessive cloud cover may also limit ground heating, reducing thermal wind formation and potentially causing a decline in migration of species that predominantly rely on thermals for movement, such as raptors (Pope et al. 2006). Depending on the visibility due to the aforementioned weather conditions or other factors such as rain, fog, or snow, transmission lines may be more difficult to see, increasing the likelihood of a collision (Mathiasson 1992). Visibility can also be affected by the time of day. Lines become increasingly difficult to see at times with poor lighting, such as night, dawn, or dusk, which may pose a greater risk to migratory species because they are not necessarily as familiar with a particular region as resident species. One study found that, during observations of waterfowl flights across a transmission line, out of 433 strikes, 432 occurred at night or during poor weather (Hunting 2002). A similar study at the Lake Sangchris-Kincaid Power Plant in Illinois found that only one in 250,000 waterfowl collided with the power lines during the day (Anderson 1978). Further studies by Stout and Cornwell (1976) also emphasize the risk that poor visibility poses to waterfowl in the midst of power lines.

Wetlands, lakes, and streams are all potential "hot spots" for avian risk due to power lines. Because water is often used by birds to forage or congregate, adjacent power lines can pose collision risks to birds that are not aware of their presence or cannot see them. Stout and Cornwell (1976) found that in a review of reported non-hunting mortality of wild waterfowl from 1930 to 1964, 65% of collision mortalities were due to telephone and power lines. A study of migrating mute swans on the coast of Sweden found that, out of 54 swan flocks recorded during the observation period, six flocks had difficulty—but no collisions—crossing power lines, and four mortalities were observed by locals during the same period (Mathiasson 1992). Anderson (1978) postulated that the five factors that most influence waterfowl collision frequency with power lines are: 1) the number of birds present; 2) visibility; 3) species composition and behavior; 4) disturbance; and 5) familiarity with the area. Mathiasson (1992) determined that in his study, the rate of collisions was "mainly a factor of swan frequency and behaviour, and positioning of the wires in the landscape [sic]." Larger water bodies would theoretically attract more birds, and the more birds that are present, the higher the potential to have a collision with power lines. If birds are startled into leaving a water body adjacent to power lines, or are attempting to fly through the area at night when visibility is very poor, especially if they are unfamiliar with the area's vertical spatial layout, the likelihood of a bird flying into one of the lines increases. Therefore, aquatic areas are a determining factor in the risk to avian species.

Anthropogenic land use may attract or push birds into areas that contain transmission lines. A simple stretch of highway, for instance, may be an attractive area to vultures or similar species because of the sheer amount of roadkill that is created. Agriculture may attract birds foraging in the vegetation or raptors foraging for crop pests. Relatively dense building clusters may push birds into areas with transmission lines because of the flight obstacles.

3.2.3. Line-related Factors Related to Bird Collisions

Line-related factors include the configuration and location of the transmission line and transmission line placement with respect to other structures or topographic features. While it is believed that flat-line configurations are less of an avian risk than vertical configurations (Bevanger 1994), power line structure design has not been sufficiently demonstrated to suggest a specific correlation with bird collisions (Janss 2000). However, there seems to be a positive relationship between the presence of a static wire and the number of bird collisions (Bevanger 1994, Savereno et al. 1996). It is thought that, in many cases, the bird sees the conductor wires, changes its altitude to avoid them, and subsequently collides with the thinner, less-visible static wire instead. Consequently, studies have demonstrated an average mortality decline of 50 to 60% when markers are placed on static wires in relation to when wires are left unmarked (Savereno et al. 1996).

Transmission line location can also play an important role in the risks imparted to birds. Generally, there is more of a risk in placing a transmission line corridor in an open area than against an existing backdrop (Bevanger 1994). The risks to birds flying across a single corridor in an open space become dependent not only on the line's visibility, but on the altitude of the bird and its ability to first see the intruding wires, and then change its flight pattern to avoid them. On the other hand, lines that are placed against existing lines or against a landscape reference are theoretically easier to avoid. Multiple lines going through one corridor prevent birds from having to continually change their flight patterns, allowing them to instead avoid several sets of lines all at once. Similarly, lines placed along the base of a cliff, a row of trees, a building, a bridge, or a similar barrier will theoretically help avoid collisions because birds are forced to change their altitude to avoid the impediment (Bevanger 1994). The simple parallel or perpendicular placement of transmission line corridors relative to avian flyways is also an influence on the risk that the lines pose. There tends to be a greater risk in putting lines in between areas necessary for life history, such as foraging and roosting, especially if the two areas are separated by a short distance (Bevanger 1994). If a line is placed near a ridgeline, the risk to avian species can increase. When horizontal winds get deflected upward by ridgelines, the resulting updrafts get used by raptors to gain elevation for gliding purposes. Raptors will also use thermals, which can rise to hundreds or thousands of meters, for gliding purposes (Pope et al. 2006). Lines that are placed near ridgelines can pose collision risks to birds that may be using updrafts or thermals in their migratory paths and may not see the transmission lines in time to maneuver out of the way. Alternatively, canyons or valleys may act as funnels for migrating birds, and can pose collision risks if lines cross perpendicular to the natural direction of flight. Research suggests that wind turbines placed near gullies may pose higher risks to birds passing through (Thelander and Rugge 2000). It may be reasonably assumed that transmission towers, poles, or lines pose a similar risk. If water is present, the issue may become further complicated because more birds have the potential to be attracted to the area as they are migrating through.

Bird collisions also tend to occur with transmission lines when migrant species travel at reduced altitudes near tall structures, such as transmission lines and towers. It is difficult to predict the magnitude of collision-caused bird mortality without extensive information on bird species and movements in the Project vicinity. This data is not available for the proposed transmission line study area; however, it is generally expected that collision mortality would be greatest where the movements of susceptible species are the greatest (e.g., near open bodies of water, wetlands, ridgelines), such as Castaic Reservoir. A portion of this area already supports existing transmission lines. It is possible that birds would strike the new transmission lines, but it is not expected to result in a substantial increase from current conditions due to the existing transmission lines. Because the new 230 kV circuit would be placed on existing towers, construction of this portion of the Project would not result in changes to tower heights or increased vertical obstacles.

3.3 SPECIAL-STATUS AVIAN SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Because nearly all avian species in the United States have protection under the Migratory Bird Treaty Act, avian species that have other state or federal levels of protection besides the MBTA are referred to as "special-status" to denote their extra levels of protection. Table 1 summarizes the special-status avian species that may occur within the Project area, including their regulatory statuses, habitat requirements, and potentials to occur within the individual components of the Project. Species occurrence potentials were determined according to the following criteria:

- **Absent (A)**: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.
- **Unlikely (U)**: Species or sign not observed on the site, but conditions marginal for occurrence.
- **Possible (Po)**: Species or sign not observed on the site, but conditions suitable for occurrence and/or an historical record exists in the vicinity.
- **Likely (L)**: Species or sign not observed on the site, but reasonably certain to occur on the site based on conditions, species ranges, and recent records.
- **Present (Pr)**: Species or sign of their presence recently observed on the site.

TABLE 1. SPECIAL-STATUS AVIAN SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROPOSED ACTION AREA

Species	Scientific Name	Regulatory Status			Habitat Requirements	Potential to Occur – Proposed Action		
		Federal	State	Other		New 230 kV Transmission Line	New 230 kV Circuit	Reconductoring
Northern Goshawk	*Accipiter gentilis*	FSS		CDFG SC	In or near coniferous forests. Nests constructed on north slopes near water in red firs, lodgepole pines, Jeffrey pines, and aspens.	A	A	A
Golden Eagle	*Aquila chrysaetos*			CDFG FP, CDFG WL, USFWS BCC	Nests in cliffs or large trees, typically in mountainous regions and in the vicinity of open grassland or oak savanna habitat. Forages in areas of open habitat.	Pr	A	Pr
Burrowing Owl	*Athene cunicularia*			CDFG SC, USFWS BCC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Uses rodent burrows in sparse grassland, desert, and agricultural habitats.	L	A	L
Swainson's Hawk	*Buteo swainsonii*		ST	USFWS BCC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, agricultural areas, and ranches. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Po	A	Po
Western Yellow-Billed Cuckoo	*Coccyzus americanus occidentalis*	FC	SE	USFWS BCC	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in willow and cottonwood forest, with understory of blackberry, nettles, or wild grape.	Po	A	Po
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE	SE		Riparian woodlands in Southern California.	Po	A	Po
Peregrine falcon	*Falco peregrinus*	Delisted	SE	CDFG FP, USFWS BCC	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds, and man-made structures. Nest consists of a scrape on a depression or a ledge in an open site.	Po	Po	Po
California Condor	*Gymnogyps californianus*	FE	SE		Requires vast expanses of open savannah, grass savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Microhabitat consists of deep canyons with rocky walls for nesting sites. Forages up to 150 miles from roost/nest.	Po	Pr	Pr

Species	Scientific Name	Regulatory Status			Habitat Requirements	Potential to Occur – Proposed Action		
		Federal	State	Other		New 230 kV Transmission Line	New 230 kV Circuit	Reconductoring
Bald Eagle	*Haliaeetus leucocephalus*	Delisted	SE	CDFG FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests are within one mile of water. Nests in large, old-growth or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	A	Po	A
Loggerhead Shrike	*Lanius ludovicianus*			CDFG SC, USFWS BCC	Open space with patchy shrubs and trees, including desert scrub, agricultural areas, pastoral habitat, and suburban areas.	Pr	Po	Pr
Coastal California Gnatcatcher	*Polioptila californica californica*	FT		CDFG SC	Obligate, permanent resident of coastal sage scrub below 2,500 feet in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	A	Pr	Pr
California Spotted Owl	*Strix occidentalis occidentalis*	FSS		CDFG SC, USFWS BCC	Mixed conifer forest, often with an understory of black oaks and other deciduous hardwoods. Canopy closure greater than 40%. Most often found in deep-shaded canyons, on north-facing slopes, and within 300 meters of water.	Po	Po	Po
Least Bell's Vireo	*Vireo bellii pusillus*	FE	SE	USFWS BCC	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms, below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, *Baccharis*, mesquite.	Po	Pr	Po

Listing Status:

U.S. Fish and Wildlife Service (USFWS)
FE = listed as Endangered under ESA
FT = listed as Threatened under ESA
FC= Candidate for listing under ESA
BCC = Bird of Conservation Concern
Delisted = Formerly listed under ESA

US Forest Service (USFS)
FSS = Forest Service Sensitive

California Department of Fish and Game (CDFG)
SE = listed as Endangered under CESA
ST = listed as Threatened under CESA
SC= listed as Species of Concern
FP = listed as Fully Protected under CDFG Code

4.0 AVIAN PROTECTION PLAN COMPONENTS

The following section describes APP components and how they pertain to the construction of the BRRTP. There are twelve components to an APP, as determined by APLIC (2005):

- Corporate policy
- Training
- Permit compliance
- Construction design standards
- Nest management
- Avian reporting system
- Risk assessment methodology

- Mortality reduction measures
- Avian enhancement options
- Quality control
- Public awareness
- Key resources

Not all APPs will contain information about all twelve components, as each document will be specific to the utility and its needs. The components outlined below provide background information where appropriate on how each component is relevant to the BRRTP and how it will be implemented. At the end of each component, where applicable, a summary is provided to give a clear statement of what actions LADWP will take to ensure avian safety during the BRRTP's construction.

4.1 LADWP AVIAN PROTECTION POLICY

The Los Angeles Department of Water and Power recognizes that not only can avian interactions and collisions with its facilities cause bird injuries or deaths, but that they can cause utility outages, raise utility rates, result in fires in adjacent areas, or lead to strained relationships between LADWP and overseeing resource agencies or the general public. As such, LADWP is committed to protecting avian species that occur within the vicinity of its projects, structures, and complexes. The responsibility of effectively protecting avian species and minimizing avian risk at its facilities lies both with LADWP management and with its employees.

To this end, LADWP will:

- Implement and comply with this Avian Protection Plan (APP);
- Ensure that its actions comply with the most recent applicable laws, regulations, permits, APP procedures, and any applicable APLIC guidelines that may be updated in the future;
- Document bird mortalities; problem poles, towers, or lines; and problem nests;
- Provide information, resources, and training to improve its employees' knowledge and awareness of the APP;
- Retrofit any poles or towers that appear to be problem spots for avian safety, or where a protected bird species has been killed; and
- Participate in or sponsor research or development furthering avian power line interaction safety, and incorporate any new advancements that develop as a result of this research, as applicable to LADWP power lines or transmission structures.

4.2 TRAINING

LADWP project management, supervisors, construction crews, and contractors will undergo avian protection awareness training prior to construction on BRRTP. Ensuring that Project personnel are knowledgeable and aware of the protocols and methods outlined in this APP will decrease the likelihood of dangerous avian interactions and increase the likelihood of quick and efficient responses to incidents. All BRRTP on-site Project personnel will undergo a Worker Environmental Awareness Program (WEAP) that places emphasis on LADWP's avian protection policy (described above in Section 4.1, LADWP Avian Protection Policy), any Project permits that may be issued for avian protection, special-status avian species that could occur during construction and where they would be most likely to occur, how to identify these species, their natural histories where relevant to local construction activity, what construction measures and best management practices to employ to ensure their safety, and what steps to take should an avian injury or mortality occur—including carcass disposal protocol—or should a bird nest be discovered within 500 feet of the general construction area. Training will also include a discussion of the law and the consequences for non-compliance with this APP and/or with applicable permits or regulations. All new construction personnel will be required to undergo WEAP training prior to starting work on BRRTP. For a more explicit discussion of how newly discovered nests or avian incidents will be reported, see Section 4.5, Nest Management, and Section 4.6, Avian Reporting System, respectively.

Summary

- All LADWP Project-related management, supervisors, crew members, and contractors will undergo an avian protection awareness training prior to the start of construction.
- All LADWP on-site personnel will undergo WEAP training with emphasis on avian protection prior to the start of construction.
- All new construction personnel will undergo WEAP training before they begin work.

4.3 PERMIT COMPLIANCE

LADWP and its Project personnel, including contractors, will at all times attempt to remain in compliance with applicable avian permits that may be issued for the construction of BRRTP. Should construction be found to be out of compliance with a Project permit, LADWP Environmental Services staff will be notified so that the non-compliance can be documented with the appropriate resource agency and appropriate remedial actions can be taken.

The following permits may be applicable to the construction of the BRRTP. However, it is unknown which or how many of these would be required or issued for this Project. Currently, LADWP does not possess federal or State permits pertaining to migratory birds, eagles or federally listed avian species. It is not authorized to capture injured birds, remove inactive eagle or colonial bird nests, disturb active nests of any bird species, or remove or store carcasses. Any such activity will be conducted by the USFWS or under their direct supervision. This APP will be modified if LADWP obtains a permit in the future.

- **Incidental Take Permits** – Incidental take permits are issued to allow the take of specified individuals per the conditions within each permit.
    - **Section 7 Incidental Take Statement** – The only federally listed avian species known to be in the Project area that are at risk for collision or mortality are the California condor, coastal California gnatcatcher, and least Bell's vireo. Because of the voltage of the BRRTP transmission lines and the large separation distance that will be required, electrocution is highly unlikely. Based on 2008 and 2009 California condor tracking information provided by USFWS, this species is expected to be present or in the vicinity of the new 230 kV circuit and the lowermost portions of the reconductoring corridor, in the San Gabriel Mountains (USFWS 2008, USFWS 2009). Coastal California gnatcatchers were observed in the Project area near Castaic Lake during BRRTP bird use count surveys conducted by POWER Engineers, Inc. (POWER) in 2010 and 2011 and by POWER biologists on the southern end of the reconductoring component in the winter of 2009/2010. A population of least Bell's vireo was observed numerous times between Castaic Lake and Castaic Lagoon between April and July 2005. Because construction in these two areas will be on existing towers and not on new towers, LADWP will confirm that towers that are in the vicinity of documented condor activity sufficiently meet construction design standards applicable to this species as described in Section 4.4, Construction Design Standards. To reduce the risk of collision, LADWP will also implement markers to assist birds in detecting power lines, also described in Section 4.4. If it is determined that there is still an electrocution or collision risk to California condors—or to any other species that may become federally listed prior to construction—as a result of BRRTP's construction, LADWP may need to seek a Section 7 Incidental Take Statement which, if issued, would describe the amount of take of each applicable species that would be allowed.
    - **Bald and Golden Eagle Act Permit** – Based on known occurrences and activities in the vicinity of the Project area, it is not expected that a permit for take of bald or golden eagles will be necessary during BRRTP's construction. Should any eagle electrocution or collision

incidents occur during construction or should an eagle nest be discovered that will be impacted by construction, LADWP construction crews will carry out measures described in Section 4.5, Nest Management, and Section 4.6, Avian Reporting System, and immediately notify LADWP Environmental Services staff, who will in turn report the information to USFWS.

  - **Section 2081 Permit** – These are incidental take permits for State-listed species, authorized by CDFG under Sections 2081(b) and (c) of the California Endangered Species Act. They are issued in circumstances where the take is incidental to an otherwise lawful activity; where impacts of the take are minimized and fully mitigated; where the mitigation measures are roughly proportional in extent to the impact, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation; where adequate funding is available for implementation and monitoring of the mitigation measures; and where the permit will not jeopardize the species' continued existence. State-listed species that may be at risk of electrocution or collision during BRRTP's construction based on potential or known occurrence information include Swainson's hawk, peregrine falcon, California condor, and bald eagle. Where these species are at greater risk, LADWP will implement avian safety measures recommended in Section 4.4, Construction Design Standards, and will document incidents as described in Section 4.5, Nest Management, and Section 4.6, Avian Reporting System. These measures will be implemented on new and existing transmission lines as applicable based on known or possible occurrence information.

- **Collection/Salvage Permits** – These permits are required to collect, salvage, or handle birds.
  - **State Scientific Collecting Permit** – These permits are issued by CDFG and allow the collection, salvage, or capture and release of special-status species as allowed by the individual permit conditions. LADWP will seek this permit from CDFG if any of these actions is required during BRRTP's construction due to electrocution, collision, or other construction-related incidents.
  - **Federal Migratory Bird Permit** – These permits are issued by USFWS under the MBTA and may be required if it is necessary to salvage and/or rehabilitate birds protected by the MBTA during construction. The USFWS Pacific Southwest Region's Migratory Bird Office is located at the Pacific Southwest Regional Office in Sacramento, CA. CDFG Code 3513 also prohibits the take or possession of any migratory nongame bird protected by the MBTA, except where allowed by the Secretary of the Interior.
- **Nest Removal and Relocation Permits** – Bird nests are protected by the MBTA and by CDFG Code. Under the MBTA, it is illegal to possess, sell, purchase, barter, transport, import, export, or take—defined as collecting, for nests—or attempt any of those actions on a migratory bird nest (USFWS 2003). Under CDFG Code 3503 and 3503.5, it is illegal to take, possess, or needlessly destroy the nest or eggs of any bird, including any in the orders *Falconiformes* or *Strigiformes*, except as otherwise provided by CDFG Code or pursuant regulations. However, it is lawful to remove inactive nests or nests during the non-breeding season for most birds, excepting those of eagles and listed species. When it is necessary to remove a protected nest as dictated by the MBTA and CDFG Code, LADWP will seek permits from USFWS and CDFG prior to taking any further actions other than those described under Section 4.5, Nest Management.

4.4 CONSTRUCTION DESIGN STANDARDS

Constructing avian-safe transmission towers and poles is an integral part of safeguarding against avian electrocutions. The electrical design factor most crucial to avian electrocutions is the physical separation between energized and/or grounded structures, conductors, hardware, or equipment that can be bridged by birds to complete a circuit (APLIC 2006). APLIC recommends certain distances between energized and/or grounded parts of transmission towers and poles to minimize or avoid avian electrocutions. The recommended horizontal and vertical distances vary depending on what avian species may occur in a particular area. The standard horizontal distance recommended is 60 inches, which is expected to allow adequate clearance for most birds to safely sit between phases or between a phase and a grounded piece of hardware (such as a wire or metal brace) under normal dry conditions. This distance is based on the calculated wrist-to-wrist distance of a large golden eagle (*Aquila chrysaetos*), which is projected to be approximately 54 inches for an eagle with a wingspan of 90 inches (subtracting an estimated 18 inches on each side for the outer primary feathers) (APLIC 2006). However, according to APLIC (2006), there is insufficient data to have a reliable average wrist-to-wrist distance for condors. Because condor wingspans can be between 98 and 118 inches (APLIC 2006), a horizontal separation of 72 inches is likely adequate to accommodate the wrist-to-wrist distance. On three-phase structures such as those being used for BRRTP, a minimum vertical separation of 43 inches between energized and grounded components is required. However, in areas where long-legged wading birds, such as great blue herons (*Ardea herodias*), may occur, APLIC recommends a minimum vertical separation distance of 48 inches (APLIC 2006).

In addition to adjusting the physical separation between energized conductors/hardware and grounded conductors/hardware, there are other methods of minimizing danger to avian species from transmission structures or reducing the likelihood of accidental outages or flashovers. Some insulation methods that can help minimize bird mortalities include phase covers, bushing covers, arrestor covers, cutout covers, jumper wire hoses, and covered conductors, as applicable. Apart from insulation, bird flight diverters such as spiral coils, marker balls, or swinging plates/flappers can be used to alert birds to the presence of obstacles in the air and hopefully minimize injuries or mortalities that may occur as a result of collisions. Yellow marker balls on a South Carolina transmission line contributed to a 53% reduction in bird strikes, while plastic dampers and yellow fiberglass square plates reduced mortalities by 61% and 63%, respectively, in southwestern Colorado (Manville II, 2005). Additional studies of the effectiveness of marked and unmarked power lines in reducing avian mortalities are cited in Erickson et al. (1999). It is recommended that LADWP consider the use of bird flight diverters on its new transmission lines in areas that are determined by BRRTP's avian risk assessment (described in Section 4.7, Risk Assessment Methodology) and by bird use count surveys conducted in 2010 and 2011 to be of elevated risk to native and migratory birds.

Additionally, some causes of electrical outages include conductor contact with nesting material (particularly in wet conditions), conductor-to-conductor contact caused by swaying lines after a large group of birds flushes from an area, prey falling onto energized conductors or hardware, contamination from bird feces, and bird collisions (APLIC 2006). While triangle, spike, cone, or wire perch discouragers can be used to try to deter birds from nesting in a certain area, studies have shown that these are not always successful and that birds may nest directly on top of perch discouragers due to their abilities to better hold nesting material (APLIC 2006). However, the successful use of perch discouragers also depends on the types of structures they are being used on and on their general configuration. Leaving a minimal amount of open space between conductors or between grounded and energized components will discourage birds from perching. Nesting platforms will be discussed in further detail in Section 4.9, Avian Enhancement Options.

4.4.1. New Structures

New towers for this Project are proposed over approximately 60 miles, spanning from the Angeles National Forest (ANF) at the proposed Haskell Canyon Switching Station and north into the Antelope Valley and Mojave Desert to the Barren Ridge Switching Station. The new transmission line will involve the construction of double- and triple-circuit towers and temporary tubular wood or steel poles, to be installed through the Green Valley portion of the Project while the existing transmission lines are shut down during construction. LADWP will verify that all new transmission towers and poles that are constructed for the BRRTP will have sufficient separation distances between all energized components and between energized and grounded tower components to be safe for birds as large as California condors. Because no precise wrist-to-wrist distance is available for California condors, it is determined that, based on their wingspan, a horizontal component separation distance of 72 inches throughout the Project area would likely be adequate. The vertical separation distance would be 48 inches to accommodate for any long-legged wading birds. Due to the high voltage (230 kV) of the new towers and the separation requirements dictated by the National Electric Safety Code (NESC), the new structures should exceed these minimum separation distances. In the event that adequate component separation cannot be obtained on a particular tower configuration, LADWP will reconfigure the tower(s) or install avian-safe equipment, such as conductor covers. On the northern end of the Project, the Barren Ridge Switching Station will be expanded, and at the southern end of the ANF a new switching station will be constructed in Haskell Canyon. Because it is possible that birds may nest or perch on electrical equipment within these switching stations, LADWP will cover any electrical equipment within the new switching stations that may pose electrocution risks using phase covers, bushing covers, arrestor covers, cutout covers, jumper wire hoses, covered conductors, or other insulation methods, as applicable. This would apply particularly in any areas within the switching stations where energized components on equipment may be particularly close to each other or to any grounded components.

It is unlikely that construction of the new transmission line will appreciably increase collision risk for avian species due to the fact that there are multiple transmission lines running parallel to the proposed ROW. Because the new 230 kV transmission line runs primarily parallel to the existing transmission line that will be reconductored, if there is any information regarding bird collisions, injuries, or mortalities along the existing transmission lines, towers that are constructed in any problem areas (e.g., areas of repeat collisions, areas where eagles or listed species may be known to have been previously injured or killed) will be outfitted with collision reduction measures. Methods that can be utilized for this include relocating the new line, reconfiguring its design, removing any overhead ground wires (which tend to be less visible to birds and easier to collide with), and marking the lines to increase their visibility (APLIC 1994, APLIC 2006). Lines can be marked with marker balls, swinging plates, spiral vibration dampers, bird flight diverters, avifauna spirals, or other technology as it becomes available.

Following the completion of construction, LADWP will provide USFWS with a summary of the remedial measures that have been implemented to reduce or prevent avian injuries or mortalities on the new transmission lines where deemed necessary. This summary will include all costs of the remedial measures as documentation of LADWP's efforts to protect avian species. Photos may assist in displaying the efforts.

4.4.2. Existing Structures

In addition to the new structures being constructed for BRRTP, reconductoring or placement of a new circuit will occur on existing structures within the Project area. Existing towers in these areas include three-circuit towers, four-circuit towers, and DC towers. LADWP will verify that all existing Project-related transmission towers meet the 72-inch horizontal separation for California condors (described above) between all energized components and between all energized and all grounded tower components. Due to the high voltage (230 kV) of the existing towers and the separation requirements dictated by the NESC, it is expected that the existing structures will already meet this minimum separation distance. If they do not meet this distance, appropriate avian-safe equipment, such as conductor covers, will be installed as a remedial measure.

Although the existing towers that will be reconductored or will have new a new circuit installed on them likely already meet the minimum separation distances recommended by APLIC (2006) to reduce avian electrocutions, it is still possible that collisions could occur on them if they are already problem areas. It is unlikely that reconductoring the existing lines or adding a new circuit to the existing towers would significantly increase the risk of collision. During BRRTP's construction, LADWP will retrofit or otherwise make avian-safe any transmission towers that are in known problem areas or have been identified as potentially high risk areas for avian species by the methods outlined in Section 4.7, Risk Assessment Methodology. If information on bird collisions is available from the existing lines that will be worked on, this information will be used to determine areas that warrant further investigation of avian safety and may require retrofitting. It is expected that adding marker balls, swinging plates, spiral vibration dampers, bird flight diverters, or other suitable types of equipment for making transmission lines more visible will alleviate any avian risk problems. Relocating or reconfiguring existing lines would likely be very expensive relative to increasing wire visibility and will be conducted only where other methods have failed.

Following the completion of construction, LADWP will provide USFWS with a summary of the remedial measures that have been implemented to reduce or prevent avian injuries or mortalities on the existing transmission lines if deemed necessary. This summary will include all costs of the remedial measures as documentation of LADWP's efforts to protect avian species. Photos may assist in displaying the efforts.

Summary

- LADWP will ensure that all new transmission towers will meet the recommended minimum 72-inch horizontal and 48-inch vertical separation distance between all energized and between all energized and all grounded tower components. LADWP will appropriately cover the energized and/or grounded components of any equipment in its switching stations or on its towers where perching or nesting birds may be at risk of electrocution.
- LADWP will ensure that all existing Project-related transmission towers meet the recommended minimum 72-inch horizontal and 48-inch vertical separation distance between all energized components and between all energized and all grounded tower components. Any towers that do not meet these distances will be retrofitted with conductor covers or other appropriate avian-safe equipment.
- LADWP will use any existing avian injury or mortality data to identify "problem areas" for electrocutions or collisions. Problem areas or other areas determined to be high risk will be retrofitted by covering any energized and/or grounded electrical components that may pose an electrocution risk, where applicable, installing marker balls or other bird flight diverters, and/or relocating or reconfiguring the existing lines if necessary.
- To document its costs and efforts to protect avian species, LADWP will provide USFWS with a summary of its implemented avian safety measures on its new and existing Project-related lines, including the costs of implementation (labor, materials, and management).

4.5 NEST MANAGEMENT

BRRTP construction will be scheduled to best avoid bird breeding season, which is generally from mid-February through August. If construction or vegetation removal is to occur during the breeding season, a qualified biologist will conduct preconstruction nesting bird surveys to determine if active nests of any bird species are present within the vicinity of construction. This is particularly important for any construction near riparian areas. All bird nests that are encountered during construction are to be documented using the nest reporting form below. All construction within 500 feet of an active nest is to be halted immediately until the condition of the nest can be ascertained as unobtrusively as possible. Under the MBTA, it is illegal to possess, sell, purchase, barter, transport, import, export, or take—defined as collecting, for nests—or attempt any of those actions on a migratory bird nest (USFWS 2003). While inactive bird nests—those without birds or eggs—are not protected from destruction by the MBTA, some inactive nests are protected by other regulations, including those of listed species or of bald and golden eagles. Nests of eagles or listed species cannot be altered, moved, or destroyed without specific authorization from the applicable agency (APLIC 2006). Recent legislation changes in 2009 allow take of eagle nests when there is a safety concern to people or eagles, when it is a public health and safety concern, when the nest prevents use of a human-engineered structure, or when the activity or its mitigation will have a net benefit to eagles; only inactive nests can be taken except in safety emergencies (50 CFR 22.27). However, permits are still required for nest removal and ground crews must notify Environmental Services if a problem nest is discovered. Therefore, determining the active or inactive status of a nest in the vicinity of construction is paramount to protecting the birds that may be occupying it and protecting BRRTP by ensuring smooth and avian-safe construction.

If there is question as to whether an observed nest is active or inactive, Environmental Services and the appropriate land management agency are to be consulted for assistance. Under no circumstances is an active nest to be disturbed until Environmental Services has been notified and applicable permits and/or resource agencies have been consulted for further action. The nest reporting form must be completed regardless of the active or inactive state of any nests. Construction may only proceed within the 500-foot nest buffer after the nest has been determined to be inactive or after approval has been given by Environmental Services or the applicable regulatory agency.

Should a nesting bald eagle be encountered during BRRTP's construction, USFWS has issued recommendations for avoiding or minimizing disturbance to the nest and its inhabitants (USFWS 2007). If the power line construction will be visible from the nest, USFWS recommends a buffer of 660 feet if there is no similar activity occurring within one mile of the nest; if a similar activity is occurring within one mile of the nest, USFWS recommends a construction buffer of 660 feet or as close as the other activity is allowed. Landscape buffers are recommended as available. Other activities that USFWS lists as having similar impacts to the construction of a power line include construction of one- or two-story buildings with footprints of a half-acre or less; construction of roads, trails, canals, or other linear utilities besides power lines; new or expanded agriculture and aquaculture operations; alteration of shorelines or wetlands; installation of docks or moorings; and water impoundment. If construction is not visible from the nest, USFWS recommends a buffer of 330 feet from the nest if there is no similar activity within one mile of the nest; if a similar activity is occurring within mile of the nest, USFWS recommends a construction buffer of 330 feet or as close as the other activity is allowed. All clearing, external construction, and landscaping between 330 and 660 feet of the nest should be conducted outside of the breeding season. USFWS recommends that the temporary use of loud machinery—such as is required for power line construction—be restricted to outside of the breeding season. While the breeding season for bald eagles can range from January through August, the most critical time periods when bald eagles are most sensitive to disturbance—courtship, nest building, egg-laying, and incubation—are generally from January through May (USFWS 2007).

Summary

- BRRTP construction will occur outside of the bird breeding season. If this is not possible, a qualified biologist will conduct preconstruction nesting bird surveys. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, substation sites, access/spur road locations, or any other area subject to ground disturbance. Surveys for birds shall be conducted for all areas from February 1 to August 15.
- If any nests are found in the vicinity of the Project area, all construction within 500 feet will be halted until further instruction is given by the biologist, Environmental Services, or the applicable agency. Eagle nests will be given a 660-foot buffer if construction is visible from the nest or a 330-foot buffer if not.
- All nests, regardless of activity level, will be documented with the attached Avian Nest Reporting Form.
- Active nests of common species, active or inactive eagle nests, or active or inactive nests of listed species are not to be moved without approval from Environmental Services and the appropriate land management agency or the USFWS, as applicable.
- Inactive nests of common species can be removed where they are in the path of construction, with the approval of the appropriate land management agency. Construction may proceed within 500 feet of an inactive nest of a common species, with the approval of the appropriate land management agency.

4.6 AVIAN REPORTING SYSTEM

All avian injuries or mortalities that occur during BRRTP's construction, including those that are observed after-the-fact and are a result of collision or electrocution with the existing transmission lines, are to be immediately reported to the foreman, who will then report the incident to LADWP Environmental Services for reporting to resource agencies as applicable. Following initial notification, the crew member or foreman is to fill out the avian reporting sheet below. The information entered into this form will be necessary for proper documentation of all incidents and reporting to resource agencies if necessary. If it is discovered during construction that a particular area or particular stretch of transmission line is a "hot spot" for avian safety issues, LADWP will investigate remedial measures to alleviate the issue. Following the completion of construction, LADWP will provide the USFWS with a list of avian mortalities, including dates, locations, and the species involved. If required to do so by the USFWS, LADWP will also create an account and submit information pertaining to all Project-related avian mortalities to the USFWS Bird Fatality/Injury Reporting Program, located online at https://birdreport.fws.gov/BirdReportHomePage.cfm.

Summary

- Observed bird injuries or mortalities as a result of the new transmission line or the Project-related existing transmission lines will be reported to Environmental Services and the appropriate land management agency and documented with the attached Avian Incident Reporting Form.
- If repeated incidents occur in a single area or if an incident occurs with a listed species or an eagle, LADWP will investigate the safety of the area and implement remedial measures as necessary, which is most likely to involve installing marker balls or other bird flight diverters, or relocating or reconfiguring the tower(s). Depending on the details of the incidents and the location of the problem area, the USFS may have particular recommendations or requirements for addressing the problem.
- Following the completion of construction, LADWP will provide the USFWS with a list of avian mortalities, including dates, locations, and the species involved.
- If required by the USFWS, LADWP will also create an account and submit information pertaining to all Project-related avian mortalities to the USFWS Bird Fatality/Injury Reporting Program.

LADWP Barren Ridge Renewable Transmission Project Avian Nest Reporting Form

Discoverer's Name ____________________

Discoverer's Phone Number ____________ **Date of Nest Discovery** ____________

Nest Location (circle one) Tower/Pole Tree Shrub Ground

Line Name, Voltage, and Closest Tower/Pole ID ____________________

Other Specific Location Information ____________________

Surrounding Habitat (circle all that apply)

Agricultural	Chaparral/Shrubs	Desert Scrub
Disturbed/Developed	Grassland	Riparian

Nest Condition (circle one) Active / Inactive, Intact / Inactive, Partial Deterioration / Inactive, Heavy Deterioration

Describe any Bird Signs Around the Nest (feathers, scat, prey remains) ____________________

____

Are Birds Present? (circle one) Yes No

Number of Birds Visible ____________

Age of Bird(s) (circle all that apply) Adult Juvenile Nestling Eggs Unknown

Bird Species (if known) ____________

Type of Bird (circle one if species unknown)

Raptor (hawk, falcon, eagle)	Owl	Crow/Raven
Passerine (small bird)	Unknown	

Risk to Birds/Construction (circle one)

No Risk Potential Risk – Imminent Potential Risk – Not Imminent

Additional Comments ____________________

____

LADWP Barren Ridge Renewable Transmission Project
Avian Incident Reporting Form

Discoverer's Name ____

Discoverer's Phone Number ____________________ **Date of Nest Discovery** __________

Date of Incident/Discovery ____________ **Time of Incident/Discovery** ____________

Line Name, Voltage, and Tower/Pole ID ____________________________

GPS Coordinates of Incident (if available) ____________________________

Species (if known) ____

Type of Bird (circle one if species unknown)

Raptor (hawk, falcon, eagle)	Owl	Crow/Raven
Passerine (small bird)	Waterfowl	Unknown

Number of Birds ____________________

Age of Bird(s) (circle all that apply) Adult Juvenile Nestling Eggs Unknown

Surrounding Habitat (circle all that apply)

Agricultural	Chaparral/Shrubs	Desert Scrub
Disturbed/Developed	Grassland	Riparian

Type of Incident (circle one) Injury Mortality

Description of Incident. Include condition of bird, circumstances of incident and cause of injury or mortality, and any damage or impacts to construction. ____________________________

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Please attach a picture of the bird, if possible.

4.7 RISK ASSESSMENT METHODOLOGY

To better understand the potential risks that the original proposed Project presented to birds, POWER Engineers, Inc. (POWER) conducted a preliminary preconstruction avian risk assessment across the entire Project area. This avian risk assessment used wind pattern, topographical, and vegetation data from geographic information system (GIS); data from existing studies, surveys, or databases; and data acquired during reconnaissance-level field assessments of the Project area.

Spring and fall field surveys focusing on existing and additive collision risks were conducted June 9 to 13 and September 22 to 26, 2008, respectively. The purpose of spring surveys was to characterize habitat and build data on avian activity, including species occurrence and nest sites, while the fall surveys were conducted to identify high-risk areas and record species observations. Each mile of the Project was evaluated for a series of pre-determined avian risk factors described in Table 2. These avian risk factors were grouped into two categories: collision factor or "promoters," and ecological resource enhancements. Collision factors are physical factors that influence the likelihood of collision and include topography, prevailing wind direction and velocity, and transmission line placement, among other considerations. Ecological resource enhancements are features, such as reservoirs or open aqueducts, that typically act to concentrate avian presence by providing additional resources. Analysis was predicated on the assumption that increasing numbers of factors over a given unit of analysis—in this case, over each mile of the Project—would vary directly with mortality risk to avian species (i.e., more factors = more risk).

TABLE 2. AVIAN RISK FACTORS USED IN THE BRRTP PRELIMINARY AVIAN RISK ASSESSMENT

Risk Analysis Factor	Category	Risk Analysis Question	Significance
New corridor (not in conjunction with existing lines)	Collision/mortality affector	Does the new line parallel any existing lines?	New corridors pose a risk because birds are not expecting to have to adjust their flights to avoid the new impediment(s). If lines are constructed adjacent to one another, birds only have to adjust flight once, which reduces the chance of a collision.
Wetland crossing	Collision/mortality affector	Does the new line cross a polygon or line from the National Wetland Inventory (NWI)?	Wetlands are important ecological resources to birds, and if a transmission line is cutting through a wetland, it increases the risk to birds taking off or landing, especially at night when there is less visibility.
Adjacent wetland or marsh	Ecological resource enhancement	Is the new line within 0.5 mile of NWI data?	Wetlands are important ecological resources to birds, and if a transmission line is too close, it increases the risk to birds taking off or landing at angles incompatible with the line's distance and height. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.
Ridge crossing	Collision/mortality affector	Does the new line cross a ridge at a perpendicular angle?	Raptors use thermal updrafts near ridgelines in order to achieve an appropriate soaring height. Transmission lines running perpendicular to ridgelines may pose risks to birds using winds for their migratory paths, or birds flying at an angle perpendicular to the lines.
Open water crossing	Collision/mortality affector	Does the new line cross a lake or reservoir?	Open water is an important ecological resource to birds, and if a transmission line crosses a lake or reservoir, it increases the risk to birds taking off or landing, especially at night when there is less visibility.

Risk Analysis Factor	Category	Risk Analysis Question	Significance
Adjacent water body	Ecological resource enhancement	Is the new line within 0.5 mile of a water body?	Water is an important ecological resource to birds, and if a transmission line is too close, it increases the risk to birds taking off or landing at angles incompatible with the line's distance and height. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.
Stable water body	Ecological resource enhancement	Is the new line within 0.5 mile of a water body with a stable water level and established shoreline or emergent vegetation?	Water bodies with an established shoreline containing emergent vegetation are especially important ecological resources for birds. The risk of avian collision with transmission lines is inversely related to the distance of a water body and the transmission lines in question. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.
Valley or canyon crossing	Collision/mortality affector	Does the new line cross perpendicular to a wide valley or canyon floor?	Valleys and canyons are often used by migrating birds, and if a transmission line crosses perpendicular to the direction of movement, it poses a collision risk to any birds that are passing through, especially at night when there is less visibility.
Wind direction	Collision/mortality affector	Is the new line perpendicular to prevailing winds?	Strong winds may push birds out of their flight paths, and if a transmission line is perpendicular to prevailing winds, it increases the risk that a bird will be pushed into the wires.
Wind speed	Ecological resource enhancement	Are wind speeds greater than 16.8 miles per hour at 50 meters above the ground?	Pope et al. (2006) found that at wind speeds of 15.5 mph, the lowest number of daily migrants was observed. Data for this study was binned, and 16.8 mph was seen as reasonably close to that number. Wind data obtained for GIS analysis was provided at 50 meters above the ground and was obtained from California Energy Commission (CEC) on-line sources and Fisk (2007) wind report.
Habitat separation	Collision/mortality affector	Is the new line within 0.5 mile of water/NWI data or agriculture, and are these separated by the line? Does the new line separate any other foraging, roosting, loafing, or breeding habitat?	Water bodies and agricultural lands are both habitats necessary for life stages. If a transmission line is constructed between different habitats such as these, it poses a risk to birds that may be flying between the two, especially if there is only a short distance. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.
Converging or diverging lines	Collision/mortality affector	Is the new line within 0.5 mile of converging or diverging existing lines?	Converging or diverging transmission lines may cause birds to perform multiple evasive maneuvers, increasing the chance of a collision. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.

Risk Analysis Factor	Category	Risk Analysis Question	Significance
Adjacent to ridgeline	Ecological resource enhancement	Is the new line in proximity to a ridgeline?	Raptors use thermal updrafts near ridgelines in order to achieve an appropriate soaring height. Transmission lines running near or on ridgelines may pose risks to birds using winds for their migratory paths.
Adjacent to river corridor or valley	Ecological resource enhancement	Is the new line in proximity to a valley or canyon floor?	Valleys and canyons are often used by migrating birds, and if a transmission line is near or on a valley or canyon floor, it may pose a risk to birds flying through.
Adjacent to cliffs	Ecological resource enhancement	Is the new line within 0.5 mile of terrain with a slope greater than 40%?	Certain birds, such as California condors and peregrine falcons, may use sloped areas or cliff faces for nesting. If a transmission line is too close, it may pose a risk to adults or young coming to or going from the nest. This study uses a distance of 0.5 mile in order to have the most agreement among the various factors within the analysis.

The risk analysis was based on a binary, "yes or no" approach to the above factors. If a risk analysis factor was present within a mile-long segment, then a "risk point" was awarded, else the mile received nothing. A maximum score of 15 was possible, although no analysis unit received a score greater than nine. Total scores were binned into Low Risk (Score 0 to 3), Medium Risk (Score 4 to 6), and High Risk (Score 7 to 9) categories. Based on the results acquired from this risk analysis, areas of elevated risk were determined throughout the Project area (Appendix M of the Biological Resources Technical Report). Areas that indicated higher avian risk within the Proposed Action included almost the entire new 230 kV circuit component, several areas within San Francisquito Canyon, and areas immediately north of ANF boundaries (Appendix A). Very few areas north of the ANF were determined by this risk model to be of elevated avian risk.

Following the selection of a federal agency-preferred route (Alternative 2, analyzed in this APP) for BRRTP in August 2010, bird use count (BUC) surveys were conducted by POWER biologists within the proposed Project area in October 2010 and March and April 2011. The purpose of these surveys was to record diurnal bird use data within areas that were initially determined, during the preliminary avian risk assessment, to be of elevated risk to birds according to the risk model described above. Areas that were determined to be of low risk to birds were not resurveyed during the BUC surveys, with the exception of one area. The Antelope Valley is designated by the National Audubon Society to be an Important Bird Area (IBA) which, at differing points throughout the year, supports various birds including Le Conte's thrasher (*Toxostoma lecontei*), vesper sparrow (*Pooecetes gramineus*), horned lark (*Eremophila alpestris*), mountain bluebird (*Sialia currucoides*), mountain plover (*Charadrius montanus*), northern harrier (*Circus cyaneus*), Swainson's hawk, white-faced ibis (*Plegadis chihi*), and long-billed curlew (*Numenius arquata*), along with vireos, thrushes, warblers, and other birds (National Audubon Society 2010). This IBA encompasses approximately 18.5 linear miles of the Project right-of-way and, although the avian risk assessment model found it to be a low risk area for birds, it was also surveyed during the BUC surveys due to its recognized importance to avian species. Surveys recorded data for diurnal bird use counts, small bird counts, and migration counts. While raptor nest searches were not the purpose of the surveys and were not specifically conducted, the surveys allowed for raptor nesting searches around particular sites or along access roads as surveys observed avian activity.

Use of this information facilitated the identification of areas within the Project that may be high risk areas that would be more likely to be prone to electrocution or collision. These high risk areas and other areas that may be known to be problem areas for avian safety should be considered priority for any retrofitting of existing lines. All new transmission towers will be engineered to the standards discussed above in

Section 4.4, Construction Design Standards, and will be expected to already meet avian safety standards upon energization.

Summary

- LADWP will use the BRRTP Avian Risk Assessment, BRRTP bird use count survey information, and any existing information on bird occurrences, injuries, or mortalities in the Project area to establish priorities for retrofitting existing lines. All new transmission towers will be engineered to the standards discussed above in Section 4.4, Construction Design Standards, and will be expected to be avian safe upon energization.

4.8 MORTALITY REDUCTION MEASURES

LADWP is committed to ensuring the safety of avian species that may be present in the vicinity of BRRTP. Avian safety during the construction phase of BRRTP can be acquired through the implementation of various mortality reduction measures. These can be categorized into preventative, reactive, and proactive measures.

4.8.1. Preventative Mortality Reduction Measures

Preventing future avian safety issues is the biggest step toward ensuring avian safety during the construction of BRRTP. New transmission towers and tubular steel or wood poles, as applicable, would be designed and sited to prevent raptor perching, raptor nesting, and general avian collisions and electrocutions. A more detailed discussion of Project element designs is in Section 4.4, Construction Design Standards.

Additionally, any avian safety measures that are required by Project permits or applicable laws or regulations will be strictly enforced during construction. Construction avoidance and minimization measures that are pertinent to avian safety will be implemented by construction personnel. These may include, but are not limited to, reducing habitat loss or degradation to avoid direct or indirect injuries or mortalities to birds; restoring non-essential construction areas to their preconstruction conditions; scheduling construction and vegetation removal outside of the known breeding season; having a qualified biologist conduct preconstruction nesting bird surveys if construction is during the breeding season; utilizing required nest safety buffers as necessary if construction is during the breeding season; minimizing disturbance to known breeding sites during or outside of the breeding season; implementing fire safety measures on construction sites; avoiding leaving trash on-site, which may attract predators or be mistaken for food by adult nesting birds; minimizing or avoiding pollution due to Project activities to the extent possible; and controlling the spread of non-native and invasive plant seeds during construction.

4.8.2. Reactive Mortality Reduction Measures

By reacting to avian safety issues during construction, LADWP can help prevent additional incidents. One method of doing this is by documenting nests and avian mortalities. More detailed discussions on how LADWP will document and manage nests and avian mortalities can be found in Sections 4.5, Nest Management, and 4.6, Avian Reporting System, respectively. LADWP will assess each case of reported nesting or avian mortality and apply corrective measures where problem areas are found. Agencies will be notified of any incidents as applicable per Project permits.

4.8.3. Proactive Mortality Reduction Measures

Being prepared for the possibility of future avian safety issues can help LADWP prevent or minimize those issues. Adequately training its construction crews, management, and contractors to be knowledgeable and aware of avian safety during BRRTP's construction is one way of ensuring that avian safety measures are implemented correctly. A more detailed discussion of LADWP's proposed avian safety training program can be found in Section 4.2, Training. Evaluating the risk potential of its existing transmission lines and retrofitting them during construction to be avian safe where necessary is also a method that LADWP can use to proactively reduce avian injuries and mortalities. Working with avian power line interaction groups or researchers can also be a way to help reduce the potential for avian mortality on BRRTP, or even further the state of current knowledge on the subject.

4.8.4. Collaborative Mortality Reduction Measures

LADWP will collaborate with the USFWS and other applicable agencies when special-status species are identified in avian safety incidents. Because the towers are already in place, it is expected that during the construction phase it will be easier to detect incidents on the towers that are being reconductored or having new circuits placed on them. Problem areas will be remediated as necessary to remove the threat of future incidents.

Summary

- LADWP will design its new towers and temporary poles to prevent perching, nesting, collisions, or electrocutions.
- LADWP construction personnel will implement avian-related mitigation measures to further protect avian species.
- LADWP will document avian incidents and nests, remedy any identified problem areas, and notify applicable agency(s) as required.
- LADWP will ensure that all Project-related personnel are trained in avian safety before they start construction.
- LADWP will retrofit any known or identified problem areas within its existing Project-related transmission lines.
- LADWP will participate with avian power line interaction groups or researchers to help further the knowledge of effective avian safety on power lines and will implement any new advancements.
- LADWP will collaborate with applicable agencies when special-status avian species are involved in incidents and will apply remedial measures as required.

4.9 AVIAN ENHANCEMENT OPTIONS

One method of enhancing avian environments around transmission lines is to construct artificial nesting facilities. Transmission towers generally have enough separation between conductors that birds are able to nest in them without affecting the line's operation, although this is not always the case and hardware can be detrimentally affected if a nest is too close to energized areas (APLIC 2006). Temporary transmission poles may be constructed within a particular section of BRRTP around the unincorporated community of Green Valley. Poles are generally at much greater risk of equipment contamination or failure as a result of nesting activities because there is only one central structure that all hardware is connected to. If a utility seeks to avoid potential risk to its electrical equipment and reduce the risk of avian electrocutions, it is desirable, but not necessary, to construct nesting platforms on poles.

If construction occurs during the nesting season and it is likely that there are risks of birds nesting on the temporary poles, LADWP will install nesting platforms in suitable areas. Because the poles will be temporary, it is preferred to avoid any nesting on these poles in the event that one or more nests are built before the poles can be removed, should any construction occur during the nesting season. LADWP will investigate the feasibility and utility of constructing nesting platforms on separate, nearby, non-energized poles that are constructed specifically as nesting alternatives. This will reduce the likelihood of delaying construction due to a bird nest(s) on the temporary energized poles. For maximum appeal to any birds, the non-energized poles will be placed close to the energized poles and will be at least as tall as the energized poles to increase visibility of the surrounding area. Placing sticks and other nesting materials on the platforms will help to attract birds to the sites to begin their own nests; placing an optional perch on the platform may also help attract birds. However, nesting platforms must not be placed in areas where there may be sensitive wildlife species that could be preyed upon by nesting raptors. Nesting tubes made of UV-resistant PVC can be attached to the sides of structures to avoid having exposed nests near conductors. Besides a standard entrance hole, the tubes should have a hole in the bottom to drain and vents on the sides, and can be positioned either horizontally or vertically on structures. Nesting platforms (for birds such as raptors and owls), nest boxes (for birds such as bluebirds and wrens), and nesting tubes (for birds such kestrels) can be made by LADWP, bought from specialty stores or nature centers, or be made with assistance from volunteers.

Because habitat suitable for avian species will be degraded or removed during the construction of the BRRTP, LADWP will restore or apply mitigation in these areas and implement noxious weed control measures to reduce the amount of degradation to avian-suitable habitat both within and adjacent to the Project area. These will be implemented to be consistent with the Project mitigation measures.

Another method of enhancing avian habitat is to enhance riparian areas. There are numerous areas, particularly in San Francisquito Canyon, where non-native vegetation—particularly giant reed (*Arundo donax*)—is a serious threat to riparian habitat. Restoring these areas or sponsoring their restoration is one way in which LADWP can enhance habitat for avian species during construction of BRRTP. Applicable agencies such as the U.S. Department of Agriculture, Forest Service, CDFG, or USFWS may be consulted for guidance in this matter.

Summary

- If construction occurs during the nesting season, LADWP will construct nesting platforms or other nesting aids on separate, non-energized poles to avoid construction delays from nests in the temporary energized poles.
- LADWP will restore or apply mitigation in all areas that are disturbed during construction.
- LADWP will restore or sponsor the restoration of riparian areas to enhance habitat for riparian birds.

4.10 QUALITY CONTROL

LADWP will implement quality control measures to ensure that this APP is accurate, up-to-date, and used effectively during construction. These measures will include the following:

- LADWP line crews, field engineers, operators, foremen, and design personnel, as well as all construction contractors associated with the BRRTP, are tasked with understanding and complying with this plan.
- Quality control will be overseen by a senior staff member(s) of LADWP's Environmental Services group who will provide quarterly reports to LADWP's General Management.
- The designated staff member(s) will review submitted nest reporting forms and avian incident reporting forms and ensure that they are properly and adequately completed. Any missing information will be obtained from the worker who completed the form. The staff member(s) will ensure that a local (LADWP) incident database is kept up-to-date and, if requested by USFWS, that incidents are consistently reported to the USFWS Bird Fatality/Injury Reporting Program. Any problems with the reporting system will be reported to management for review and remedial action will be taken.
- Any transmission towers or sections of conductor that are fitted with avian safety measures during construction will be monitored for effectiveness—by checking for injured birds, carcasses, or signs of potentially risky nest-building—daily while construction is in the vicinity of the problem area. This task will be delegated by the construction foreman; results will be reported to the foreman, who will in turn report to Environmental Services. Any observed incidents of

nesting, injury, or mortality will be investigated for further remedial actions, which will then be determined and implemented.

- LADWP will review the implementation and success of the APP with USFWS and CDFG every six months during construction of the BRRTP and adjust the parameters and methods accordingly.

4.11 PUBLIC AWARENESS

Public relations are an integral part of everyday business with utility companies, and in times of increasing environmental awareness, public support for a company's environmental program is a great way to boost a company's image. Public awareness of a successfully implemented Avian Protection Plan for the construction of the Barren Ridge Renewable Transmission Project can help create positive publicity and relationships between LADWP and resource agencies, non-profit organizations, researchers and scientists, or Native American Tribes. This can, in turn, further boost public approval of LADWP, its environmental program, and possibly of its future projects should they implement the same level of environmental protection as BRRTP and that demonstrated by this APP.

There are numerous ways that LADWP can reach out to the general public to raise awareness of its avian safety measures during the construction of BRRTP. One of the easiest methods of raising public awareness is to maintain a section on the BRRTP website (http://www.ladwp.com/barrenridge*)* devoted to documenting visual (photographic) progress of the Project's construction, and which contains both a copy of this APP and information on its effective implementation. Photographs or videos showing avian-safe transmission structures would be a key element of the website. Periodic newsletter updates through email or printed material would update interested parties on the progress and successful implementation of this APP during BRRTP's construction, as well as with information regarding imminent construction in an area of elevated avian risk and what measures will be taken to protect birds while work is being conducted. Involving the public in volunteer efforts to help implement this APP, such as during avian enhancement implementation, is also a very effective way for LADWP to increase public awareness of its avian protection policy as stated in Section 4.1, LADWP Avian Protection Policy.

Summary

- LADWP will work to raise public awareness of its avian safety efforts to increase public support by having a dedicated website for BRRTP construction-related avian safety efforts, newsletters, public involvement activities, or other methods.

4.12 KEY RESOURCES

The following entities may be contacted for further information or expertise regarding the information within this APP or the methods and strategies suggested by it:

Federal Agencies
U.S. Fish and Wildlife Service Migratory Bird Permit Office
911 N.E. 11th Avenue
Portland, OR 97232-4181
Tel. (503) 872-2715 Fax (503) 231-2019
Email: permitsR1MB@fws.gov

U.S. Fish and Wildlife Service Pacific Southwest Region Office
2800 Cottage Way, Suite w-2606
Sacramento, CA 95825
Tel. (916) 414-6600

BLM Ridgecrest Field Office
300 South Richmond
Ridgecrest, CA 93555
Tel. (760) 384-5400 Fax (760) 384-5499

USDA Forest Service Angeles National Forest Supervisor's Office
701 N. Santa Anita Ave.
Arcadia, CA 91006
Tel. (626) 574-1613 Fax (626) 574-5207

State Agencies
California Department of Fish and Game South Coast Region Main Office
4949 Viewridge Avenue
San Diego, CA 92123
Tel. (858) 467-4201 Fax (858) 467-4299

California Department of Fish and Game Central Region Main Office
1234 E. Shaw Avenue
Fresno, CA 93710
Tel. (559) 243-4005 ext. 151 Fax (559) 243-4022

Wildlife Rehabilitation Centers
Wildlife Waystation
14831 Little Tujunga Canyon Road
Angeles National Forest, CA 91342
Tel. (818) 899-5201

5.0 LITERATURE CITED

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APPENDIX A – AVIAN RISK ASSESSMENT MAPS FOR THE PROPOSED ACTION

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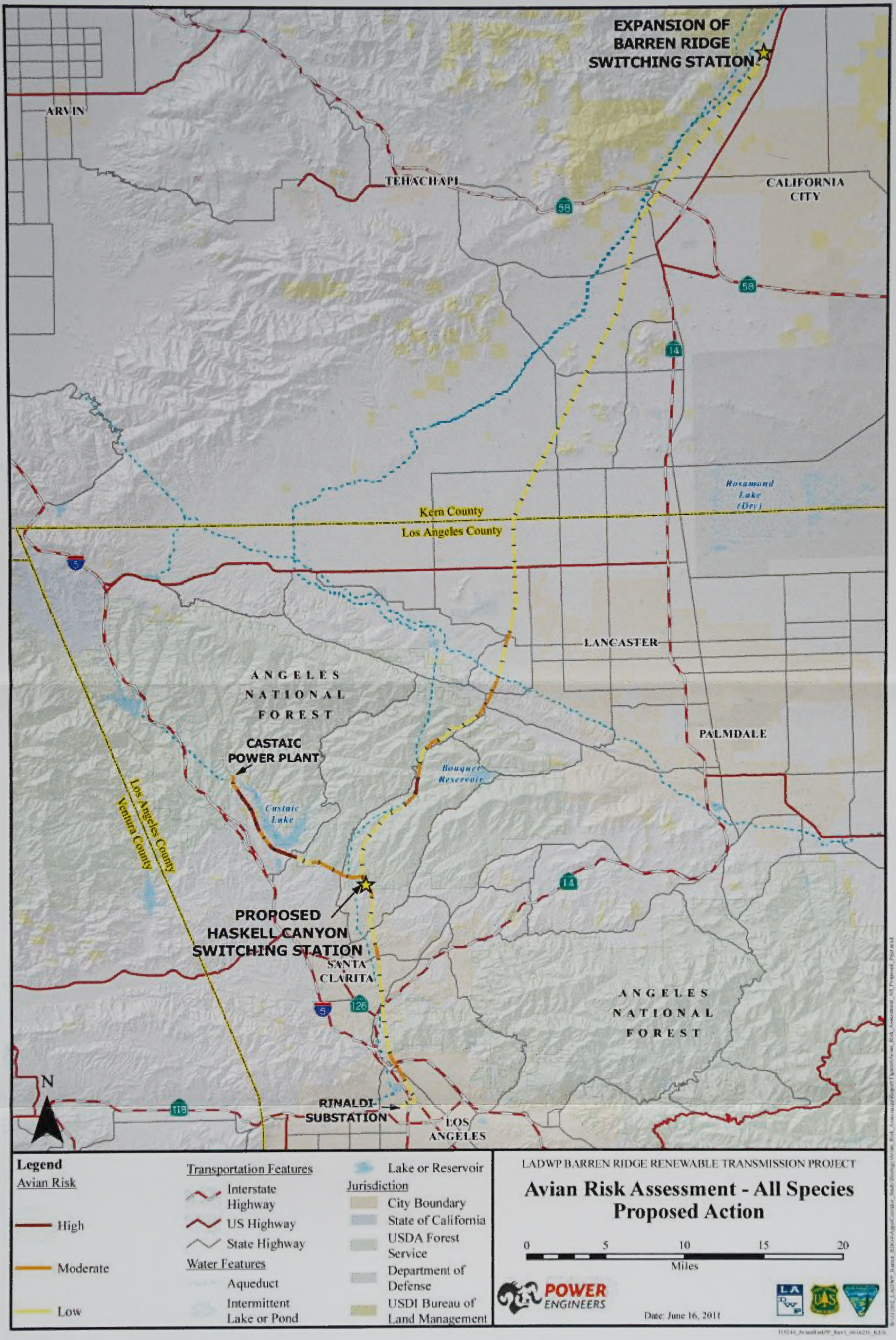
LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Avian Risk Assessment - All Species
Proposed Action

Date: June 16, 2011

EXPANSION OF
BARREN RIDGE
SWITCHING STATION
ARVIN
TEHACHAPI
CALIFORNIA
CITY
58
14
Rosamond
Lake
(Dry)
Kern County
Los Angeles County
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ANGELES
NATIONAL
FOREST
CASTAIC
POWER PLANT
PALMDALE
Bouquet
Reservoir
Castaic
Lake
Los Angeles County
Ventura County
PROPOSED
HASKELL CANYON
SWITCHING STATION
SANTA
CLARITA
126
ANGELES
NATIONAL
FOREST
N
118
RINALDI
SUBSTATION
LOS
ANGELES
Legend
Avian Risk
High
Moderate
Low
Transportation Features
Interstate
Highway
US Highway
State Highway
Water Features
Aqueduct
Intermittent
Lake or Pond
Lake or Reservoir
Jurisdiction
City Boundary
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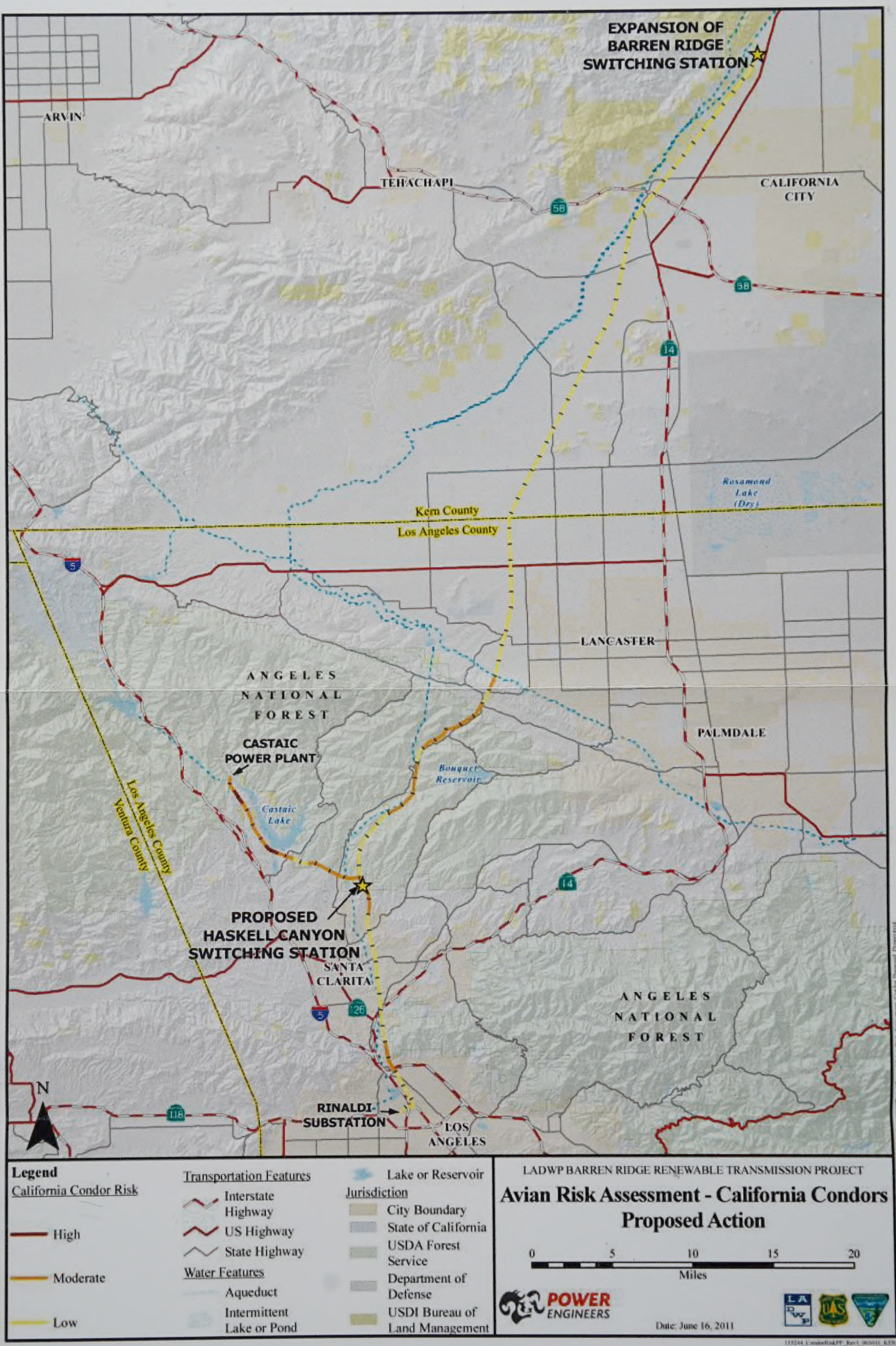
EXPANSION OF
BARREN RIDGE
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Los Angeles County
Ventura County
PROPOSED
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SWITCHING STATION
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ANGELES
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SUBSTATION
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ANGELES
Legend
California Condor Risk
High
Moderate
Low
Transportation Features
Interstate Highway
US Highway
State Highway
Water Features
Aqueduct
Intermittent Lake or Pond
Lake or Reservoir
Jurisdiction
City Boundary
State of California
USDA Forest Service
Department of Defense
USDI Bureau of Land Management
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Miles
POWER ENGINEERS

LADWP BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Avian Risk Assessment - California Condors
Proposed Action

Date: June 16, 2011

APPENDIX R: SETS OF COMMENTS AND RESPONSES FROM THE PUBLIC REVIEW OF THE DRAFT EIS/EIR

The sixty-day formal public review period for the Barren Ridge Renewable Transmission Project (BRRTP or Project) Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) ran from August 26, 2010 to October 25, 2010. Opportunities to submit comments during the review period were provided via mail, project email, web-based GIS portal, Project phone hotline, and through a series of five public meetings conducted throughout the Project area. Comments were received from agencies, Tribes, organizations, and individuals via all comment modes provided. A summary of comments received during the public review of the Draft EIS/EIR is included in Chapter 7 of the Final EIS/EIR. All substantive comments received are included in this appendix to the Final EIS/EIR for the BRRTP.

Part one of this appendix contains comments received at the public meetings held during the public comment period for the Draft EIS/EIR through GIS stations, informal oral comments during the question and answer session, and comment forms. The comments for each public meeting location are numbered and responses are labeled accordingly. For example, Lake Hughes Response-1 refers to the response to the first comment from the Lake Hughes public meeting.

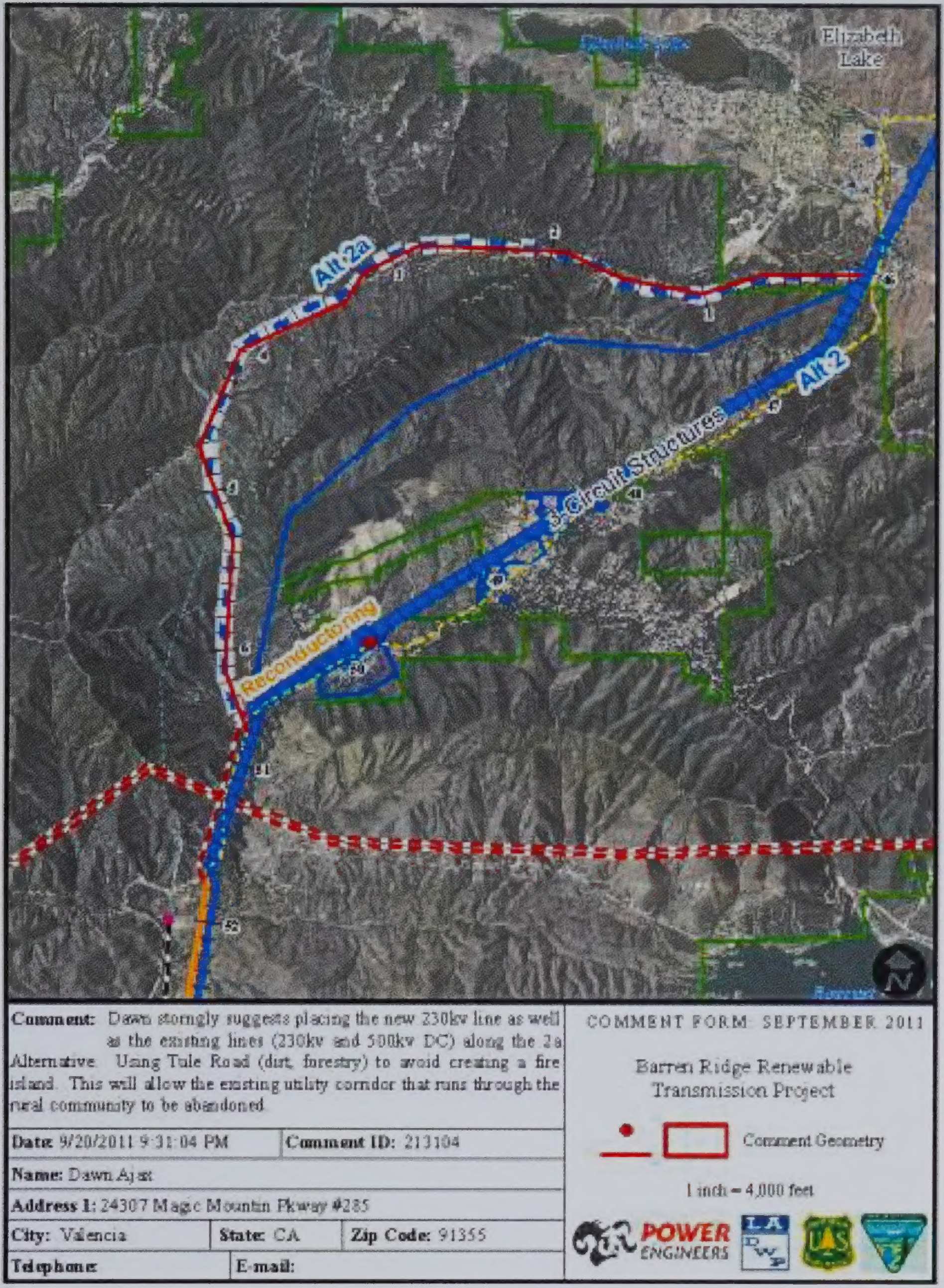
Part two of this appendix contains all agency, organization, and Tribe comment letters received during the public comment period, as well as four additional comment letters from agencies and a Tribe received between the close of the public comment period and November 7, 2011. The comment letters are lettered alphabetically and responses are labeled accordingly. For example, Response A-1 refers to the response to the first comment in comment letter A.

Part three of this appendix contains all comments received from individuals during the public comment period. Comments were submitted via letters, emails, mailed comment forms, and Project hotline messages. A copy of each substantive comment and the response from the lead agencies are provided in this section. The comments are labeled numerically and responses are labeled alphabetically. For example, Response 1-A refers to the response to the first comment in Comment Letter 1.

Comments were evaluated, and responses were prepared for substantive comments referencing significant environmental issues or issues relating to the adequacy of the EIS/EIR (40 C.F.R. 1503.4(b) and California Environmental Quality Act [CEQA] Guidelines, Section 15088). All comments will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

PART 1: PUBLIC MEETING COMMENTS AND RESPONSES

Part one contains comments received at the public meetings conducted during the public comment period for the Draft EIS/EIR through GIS stations, informal oral comments during the question and answer session, and comment forms.

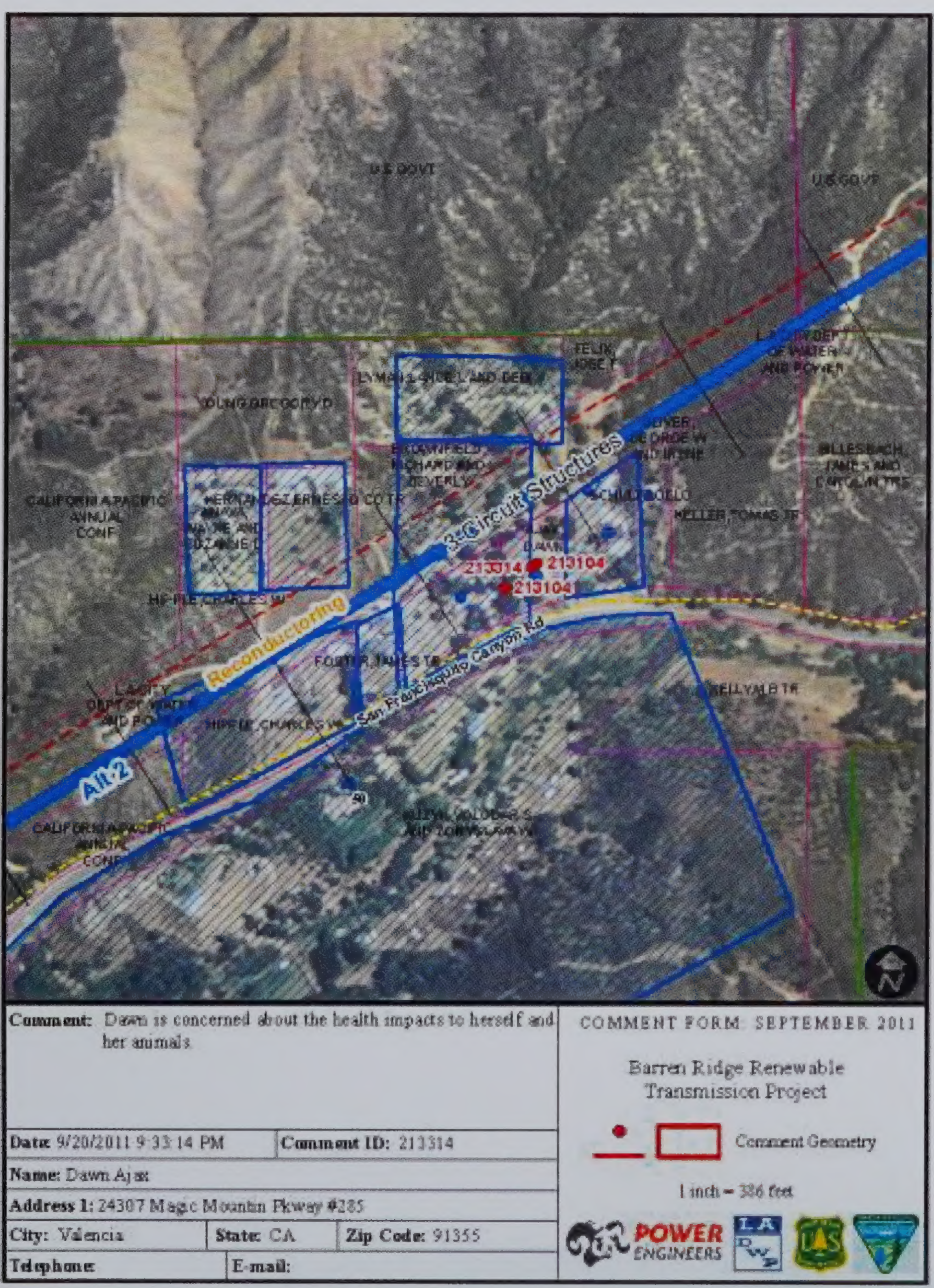


Comment: Dawn storngly suggests placing the new 230kv line as well as the existing lines (230kv and 500kv DC) along the 2a Alternative. Using Tule Road (dirt, forestry) to avoid creating a fire island. This will allow the existing utility corridor that runs through the rural community to be abandoned.

Date: 9/20/2011 9:31:04 PM	**Comment ID:** 213104
Name: Dawn Ajest	
Address 1: 24307 Magic Mountain Pkway #285	
City: Valencia	**State:** CA **Zip Code:** 91355
Telephone:	**E-mail:**

LAKE HUGHES PUBLIC MEETING

Lake Hughes Response 1: Alternative 2a, described on pages 2-106 through 2-108 of the Final EIS/EIR, would route the proposed new double-circuit 230 kV transmission line within a new corridor in the Angeles National Forest (ANF). Alternative 2a would also include the reconductoring of the existing single-circuit 230 kV line in the existing corridor through Green Valley. As a result of public comments on the Draft EIS/EIR, a new alternative in the Green Valley area, the Green Valley Multi-Line Relocation Alternative, was examined, which would locate the proposed double-circuit 230 kV and relocate the existing single-circuit 230 kV and 500 kV DC lines into a new corridor primarily in the ANF and just outside of the community. See pages 2-31 through 2-36 of the Final EIS/EIR for a full description of this alternative. As described there, the proposed route of the Green Valley Multi-Line Relocation Alternative was determined to be a feasible location for the proposed re-route. The Green Valley Multi-Line Relocation Alternative was considered but eliminated from detailed analysis in the Final EIS/EIR because it did not have the potential to avoid or minimize environmental impacts as compared to the Proposed Action. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.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3-Circuit Structures
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San Francisquito Canyon Rd
KELLY A B TR
L.A. CITY DEPT OF WATER AND POWER
HIPPLE CHARLES W
Alt 2
CALIFORNIA PACIFIC ANNUAL CONF
Comment Geometry
1 inch = 386 feet
POWER ENGINEERS
LA DWP

Comment: Dawn is concerned about the health impacts to herself and her animals.

Date: 9/20/2011 9:33:14 PM **Comment ID:** 213314

Name: Dawn Ajax

Address 1: 24307 Magic Mountain Pkway #285

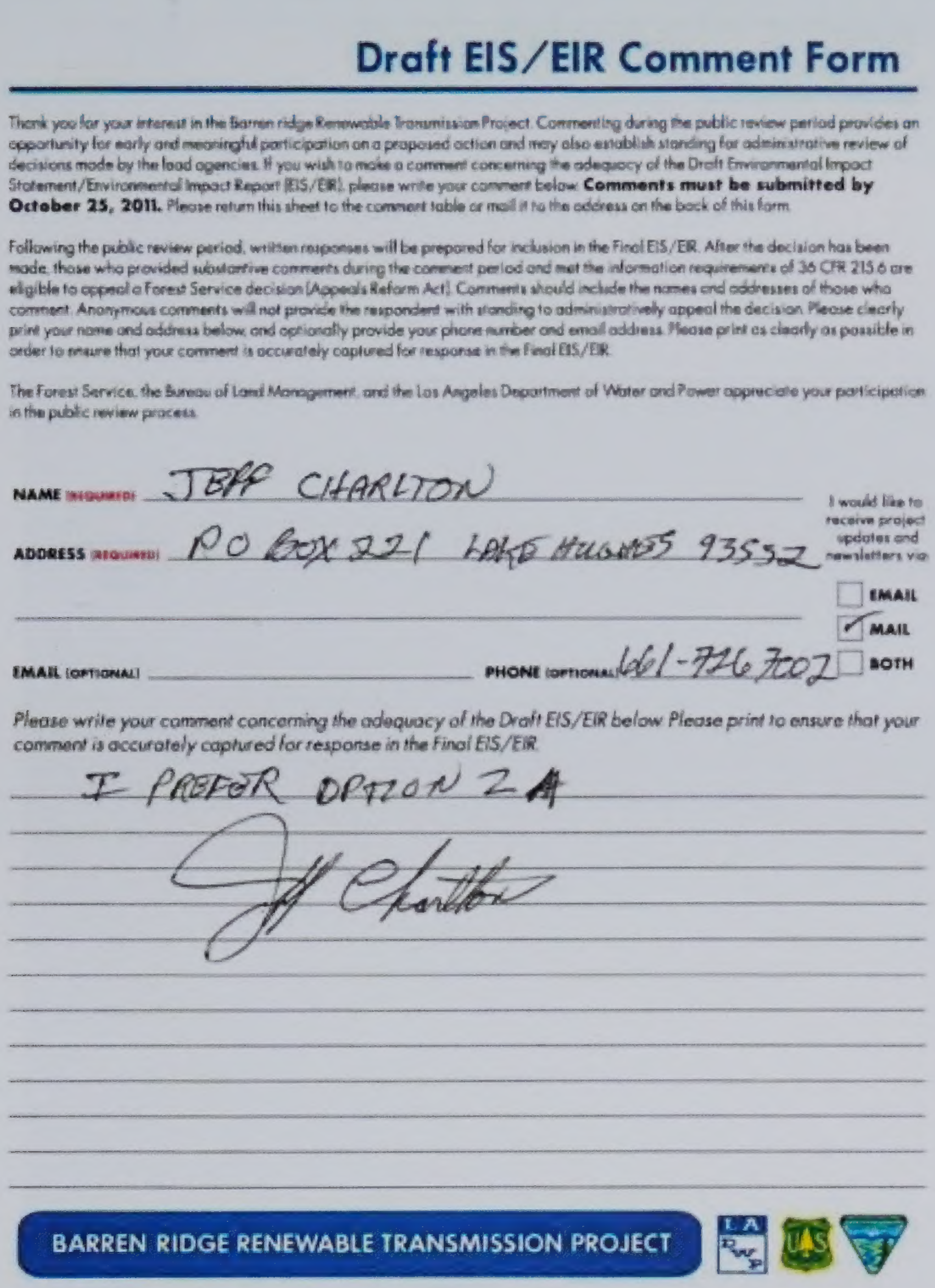
City: Valencia **State:** CA **Zip Code:** 91355

Telephone: **E-mail:**

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable Transmission Project

Lake Hughes Response 2: The analysis of air quality and climate change impacts in Section 4.2.1 of the Final EIS/EIR examines potential health impacts from the emissions of toxic air contaminants as *Criterion AIR-3: Toxic Air Contaminant Emission Significance Thresholds*. As described on page 4-7 of the Final EIS/EIR, toxic air contaminants (TACs) may be emitted from construction or operational activities. The South Coast Air Quality Management District has established significance thresholds for TACs, which indicate that, if a sensitive receptor could be exposed to TACs that would result in a health risk above 1.0 in one million for cancer risk, or 1.0 for non-cancer hazards, a significant impact would result. Using this criterion, each Alternative was evaluated and, with the implementation of mitigation measure AIR-2a, described in Section 4.2.1 of the Final EIS/EIR, was determined to have less than significant impacts. As described on page 4-308 of the Final EIS/EIR, there is no consensus in the scientific community regarding health risks associated with EMF exposure and, therefore, conclusions regarding this concern cannot be reached. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Draft EIS/EIR Comment Form

Thank you for your interest in the Barren ridge Renewable Transmission Project. Commenting during the public review period provides an opportunity for early and meaningful participation on a proposed action and may also establish standing for administrative review of decisions made by the load agencies. If you wish to make a comment concerning the adequacy of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), please write your comment below. **Comments must be submitted by October 25, 2011.** Please return this sheet to the comment table or mail it to the address on the back of this form.

Following the public review period, written responses will be prepared for inclusion in the Final EIS/EIR. After the decision has been made, those who provided substantive comments during the comment period and met the information requirements of 36 CFR 215.6 are eligible to appeal a Forest Service decision (Appeals Reform Act). Comments should include the names and addresses of those who comment. Anonymous comments will not provide the respondent with standing to administratively appeal the decision. Please clearly print your name and address below, and optionally provide your phone number and email address. Please print as clearly as possible in order to ensure that your comment is accurately captured for response in the Final EIS/EIR.

The Forest Service, the Bureau of Land Management, and the Los Angeles Department of Water and Power appreciate your participation in the public review process.

NAME (REQUIRED) JEFF CHARLTON

ADDRESS (REQUIRED) PO BOX 221 LAKE HUGHES 93532

EMAIL (OPTIONAL)

PHONE (OPTIONAL) 661-726 7002

I would like to receive project updates and newsletters via:

☐ **EMAIL**
☑ **MAIL**
☐ **BOTH**

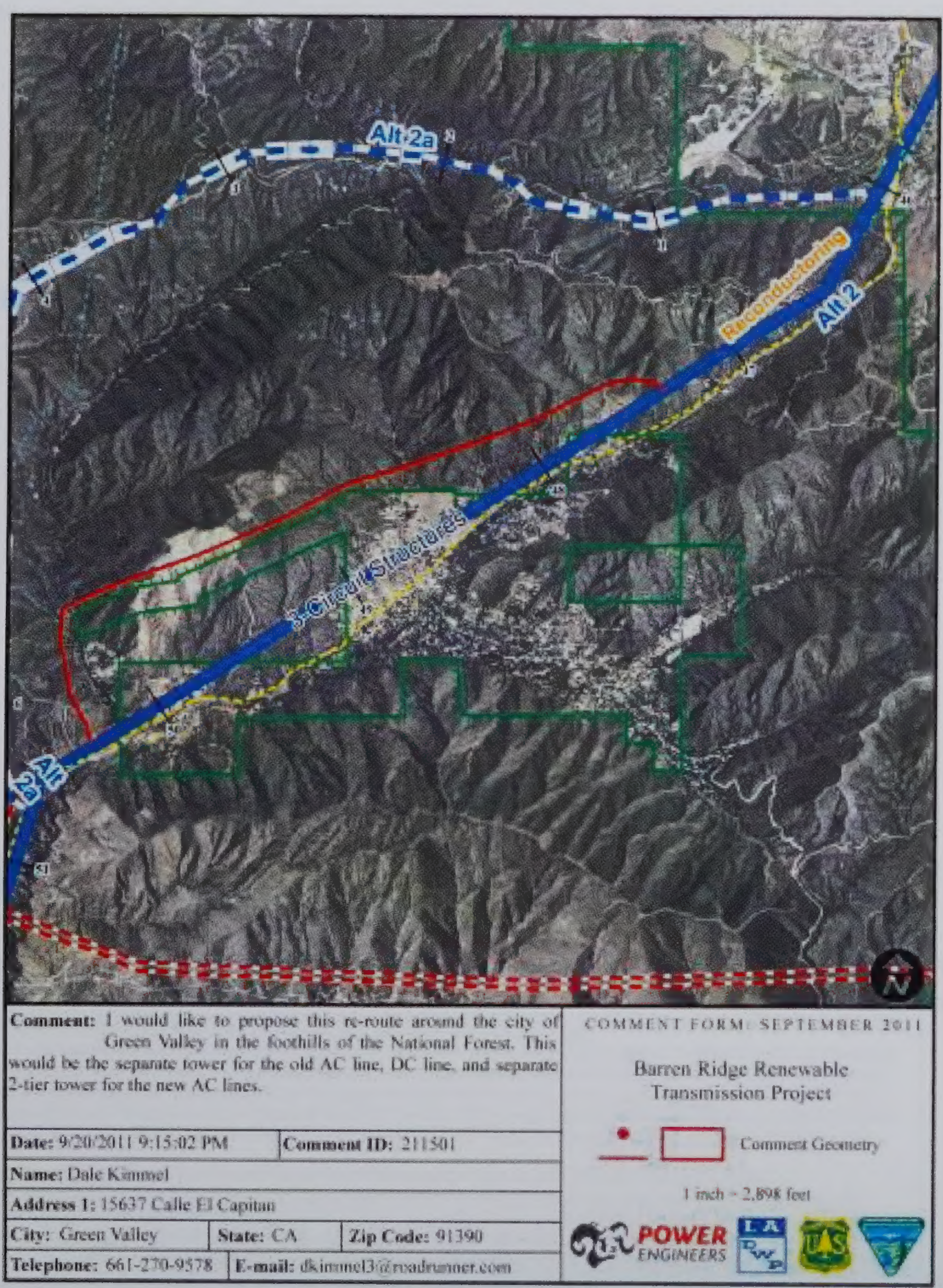
Please write your comment concerning the adequacy of the Draft EIS/EIR below. Please print to ensure that your comment is accurately captured for response in the Final EIS/EIR.

I PREFER OPTION 2A

Jeff Charlton

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Lake Hughes Response 3: Alternative 2a, described on pages 2-106 through 2-108 in the Final EIS/EIR, is one of four action Alternatives analyzed in detail in the Draft EIS/EIR. Alternative 2 has been identified as both the Federal Agency Preferred and the Environmentally Superior Alternative in the Final EIS/EIR on pages 2-135 through 2-136. Your comment in support of Alternative 2a will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Comment: I would like to propose this re-route around the city of Green Valley in the foothills of the National Forest. This would be the separate tower for the old AC line, DC line, and separate 2-tier tower for the new AC lines.

Date: 9/20/2011 9:15:02 PM
Comment ID: 211501
Name: Dale Kimmel
Address 1: 15637 Calle El Capitan
City: Green Valley
State: CA
Zip Code: 91390
Telephone: 661-270-9578
E-mail: dkimmel3@roadrunner.com

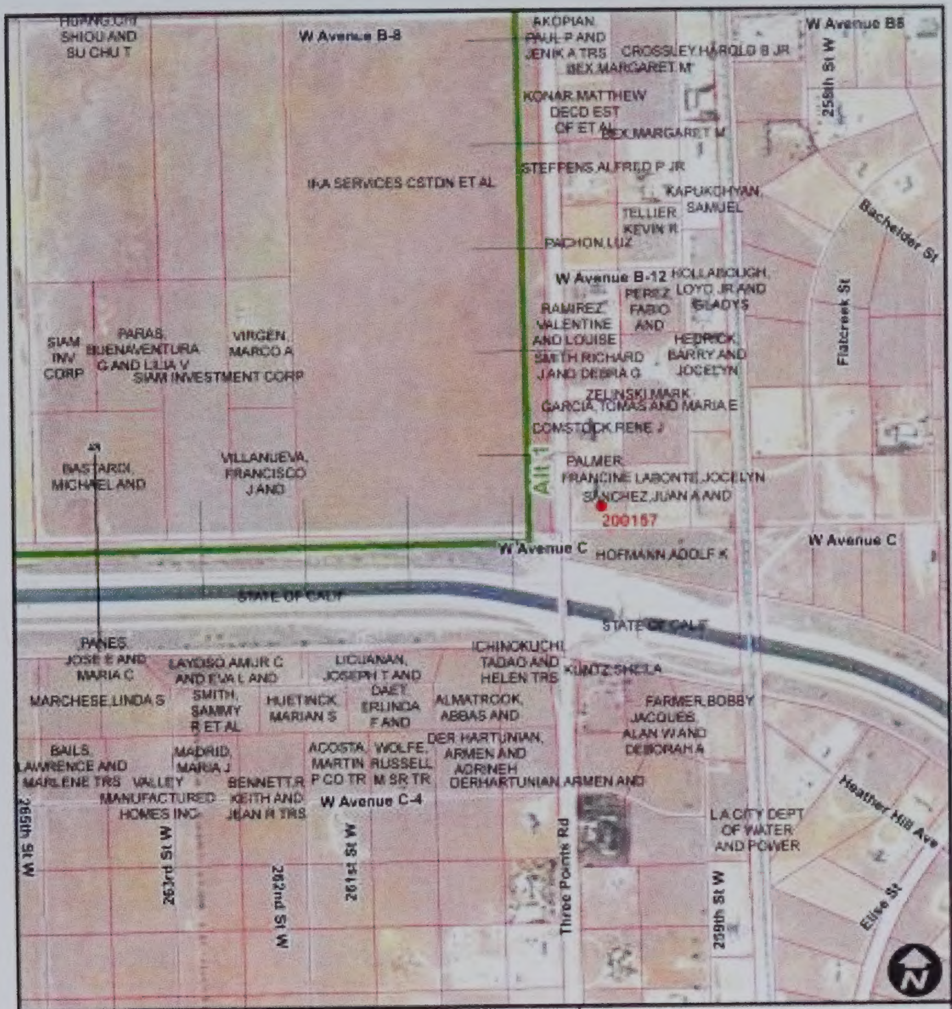
COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 2,898 feet

Lake Hughes Response 4: As a result of public comments on the Draft EIS/EIR, a new alternative in the Green Valley area, the Green Valley Multi-Line Relocation Alternative, was examined, which would locate the proposed double-circuit 230 kV and relocate the existing single-circuit 230 kV and 500 kV DC lines into a new corridor primarily in the ANF and just outside of the community. See pages 2-31 through 2-36 of the Final EIS/EIR for a full description of this alternative. As described there, the proposed route of the Green Valley Multi-Line Relocation Alternative was determined to be a feasible location for relocation of all transmission lines in the Green Valley area. The Green Valley Multi-Line Relocation Alternative was considered but eliminated from detailed analysis in the Final EIS/EIR because it did not have the potential to avoid or minimize environmental impacts as compared to the Proposed Action. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.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W Avenue B8
W Avenue B-12
W Avenue C
W Avenue C-4
258th St W
259th St W
261st St W
262nd St W
263rd St W
265th St W
Three Points Rd
Flatcreek St
Bachelder St
Heather Hill Ave
Elise St
Alt 1
STATE OF CALIF
PALMER FRANCINE
200157
HOFMANN ADOLF K
LA CITY DEPT OF WATER AND POWER
SIAM INVESTMENT CORP
N

Comment: I am concerned about alternative 1 for several reasons. 1) I have heard that the aquadcet needs at least 200ft for their ROW...there is not room to put the line here, because they need 200ft on each side where homes currently exist. 2) By putting the line here it destroys the value of my property.	
Date: 9/20/2011 8:01:57 PM	**Comment ID:** 200157
Name: Francine Palmer	
Address 1: 50008 Three Pts Rd	
City: Lancaster	**State:** ca **Zip Code:** 93536
Telephone: 661-724-1317	**E-mail:**

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

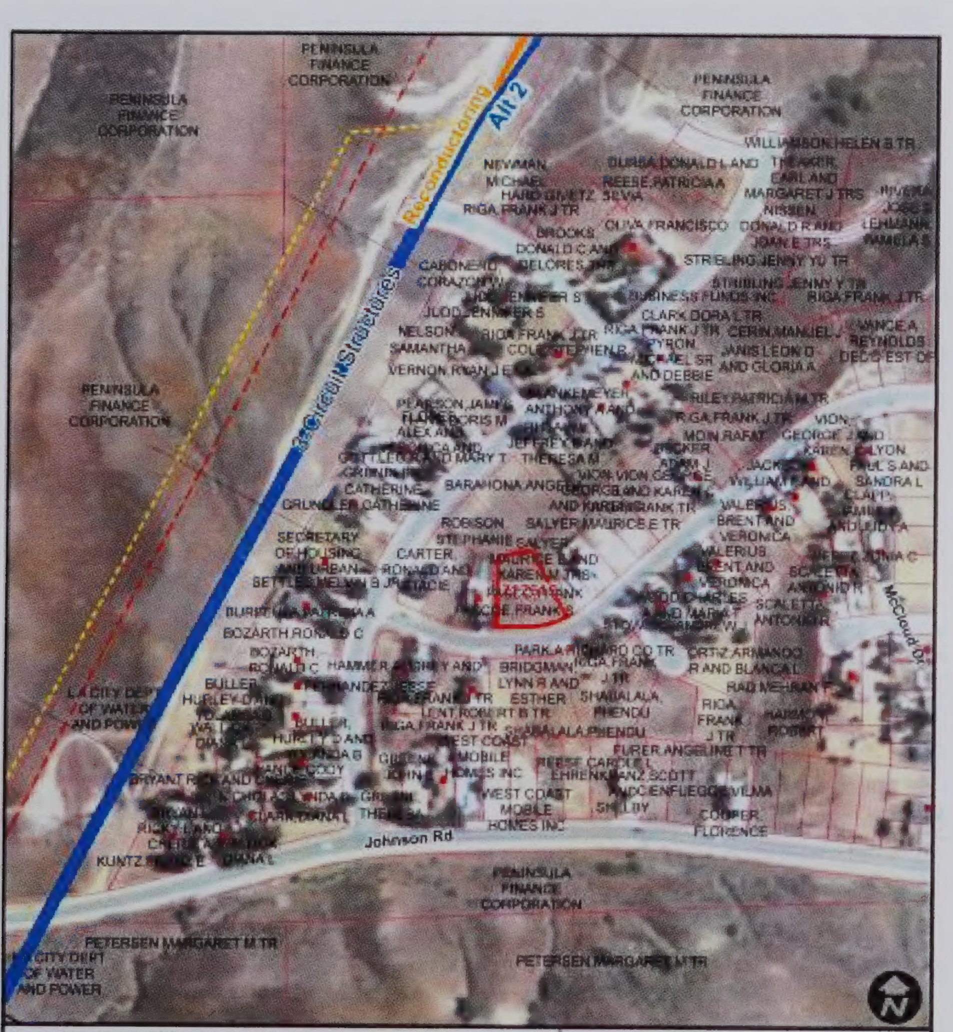
Comment Geometry

1 inch = 633 feet

POWER ENGINEERS

Lake Hughes Response 5: Alternative 1 is not the Federal Agency Preferred or Environmentally Superior Alternative, as described in Sections 2.7 and 2.8 of the Final EIS/EIR. While no private residences would be taken as a result of the implementation of Alternative 1, we understand that private property would be impacted if Alternative 1 were selected.

Alternative 1 was not selected as the Federal Agency Preferred or Environmentally Superior Alternative due to greater magnitude of potential impacts to several resources, including Land Use.



Comment: According to the FS representative/information at this meeting, it appears that all 15 resource impact categories are weighted evenly. This is inappropriate. Categories impacting people, as opposed to environmental resources are more important. Therefore, route 1 is more preferable than route 2. I request that rte 1 be considered

Date: 9/20/2011 9:26:19 PM	**Comment ID:** 212619

Name: Pam Troupe

Address 1: 21429 Peggy Joyce Lane

City: Santa Clarita	**State:** CA	**Zip Code:** 91350

Telephone: 661-297-3699	**E-mail:**

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 230 feet

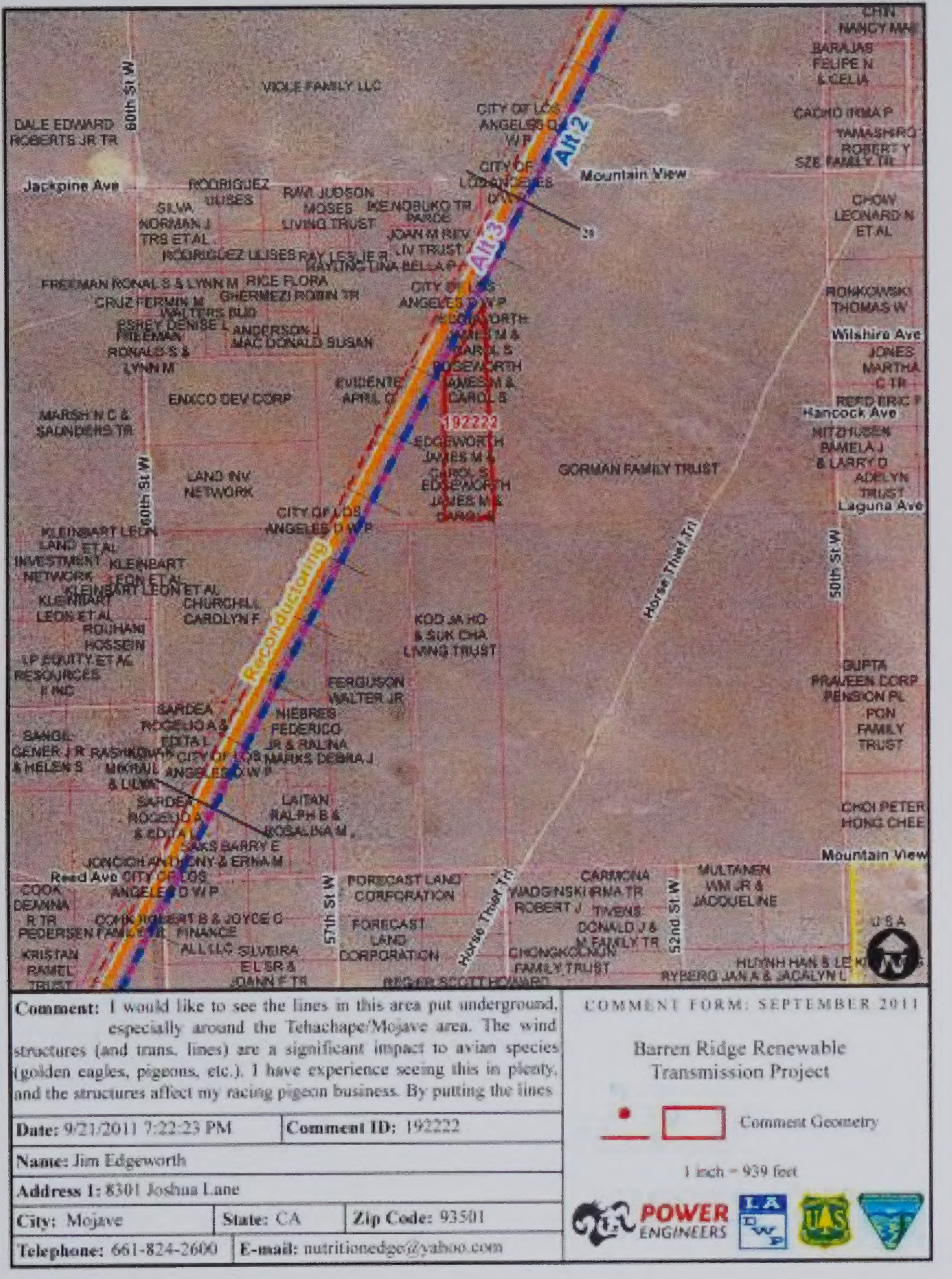
POWER ENGINEERS

Lake Hughes Response 6: The EIS/EIR is an informational document to inform public agency decision-makers and the public of the environmental impacts of the proposed Project, identify possible ways to minimize significant effects, and describe a reasonable range of alternatives. The EIS/EIR does not "weigh" impacts, but all impacts of the Proposed Action and Alternatives must be considered together. While all Alternatives identified in the EIS/EIR are under consideration in the decision-making process, Alternative 2 has been identified as the Federal Agency Preferred and Environmentally Superior Alternatives in Sections 2.7 and 2.8 of the Final EIS/EIR.

MOJAVE PUBLIC MEETING

1. Brewer-Anderson informal oral comment: Ms. Brewer-Anderson asked LADWP to consider building a technical program at a local community college to mitigate socioeconomic impacts of the Proposed Action.

Mojave Response 1: See Section 4.3.13 of the Final EIS/EIR for the discussion of Project-related socioeconomic impacts. Less-than-significant impacts were identified for employment and income, population, housing, fiscal conditions, and property values. Your suggested mitigation has been considered; however, in the absence of substantial adverse socioeconomic impacts, no mitigation measures are deemed necessary.


Alt 2
Alt 3
Reconductoring
Mountain View
Jackpine Ave
Wilshire Ave
Hancock Ave
Laguna Ave
Reed Ave
60th St W
57th St W
52nd St W
50th St W
Horse Thief Trl
192222
EDGEWORTH JAMES M & CAROL S
GORMAN FAMILY TRUST
ENXCO DEV CORP
LAND INV NETWORK
CITY OF LOS ANGELES D W P
FORECAST LAND CORPORATION
VIOLE FAMILY LLC
USA

Comment: I would like to see the lines in this area put underground, especially around the Tehachape/Mojave area. The wind structures (and trans. lines) are a significant impact to avian species (golden eagles, pigeons, etc.). I have experience seeing this in plenty, and the structures affect my racing pigeon business. By putting the lines

Date: 9/21/2011 7:22:23 PM	**Comment ID:** 192222
Name: Jim Edgeworth	
Address 1: 8301 Joshua Lane	

City: Mojave	**State:** CA	**Zip Code:** 93501
Telephone: 661-824-2600	**E-mail:** nutritionedge@yahoo.com	

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

Comment Geometry

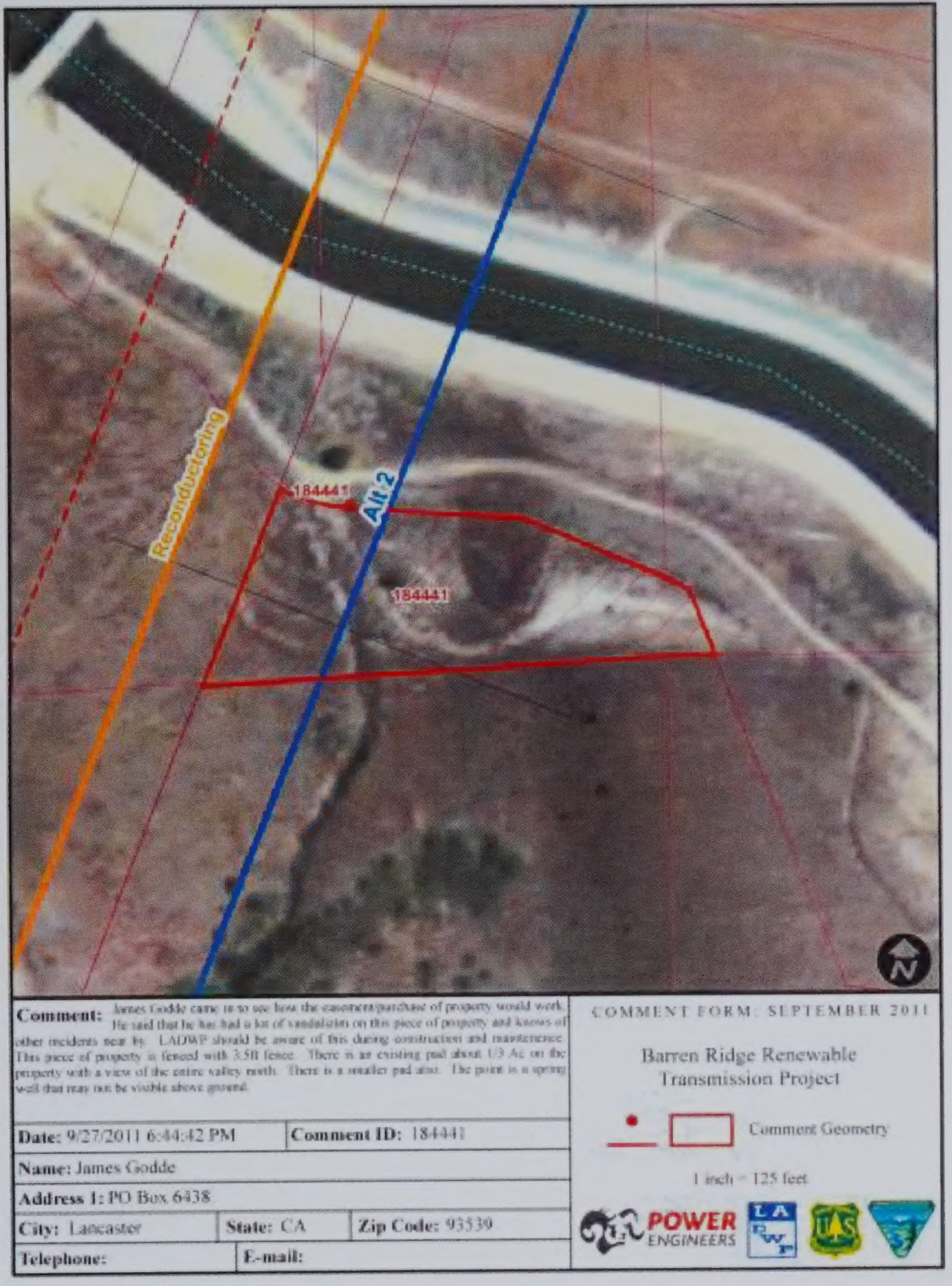
1 inch = 939 feet

POWER ENGINEERS

Mojave Response 2: As described in Chapter 2, page 2-18, of the Final EIS/EIR, an alternative to utilize underground transmission was evaluated in the Draft EIS/EIR, but was eliminated from detailed consideration because it did not avoid or minimize environmental effects and was not feasible. Transmission line impacts to avian species are detailed in Chapter 4, Section 4.3.1, Biological Resources, of the Final EIS/EIR. Per the requirements of General Practice, GP-8, an Avian Protection Plan (APP) for construction has been developed and is included as Appendix Q to this Final EIS/EIR, and an APP for operation and maintenance will be developed for implementation during Project operation (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR). The APPs outline LADWP's utilization of Avian Power Line Interaction Committee practices. Additionally, mitigation measure BIO-7 provides mitigation for potential impacts to raptors, BIO-8 provides mitigation for potential impacts to nesting birds, BIO-11 provides mitigation for potential impacts from avian electrocution of collisions on transmission lines, and BIO-14, BIO-15, BIO-16, BIO-17, BIO-18, and BIO-19 provide mitigation for potential impacts to specific species of birds (refer to Table 4-.3.1-1 in Chapter 4 of the Final EIS/EIR).

3. Edgeworth, J. Informal Oral Comment: Mr. Edgeworth commented that constructing a project in the Mojave area would contribute to wear and tear on local infrastructure and asked about the proportion of the work force that would be local to the Mojave area versus imported from other areas.

Mojave Response 3: Section 4.2.6 of the Final EIS/EIR describes potential impacts to public services and utilities. General Practice GP-32 describes repair and restoration of any damage to local roadways caused by Project construction and/or maintenance (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR). Section 4.2.13 of the Final EIS/EIR describes the potential socioeconomic impacts of the Proposed Action and Alternatives. Detailed information is provided for each Alternative regarding construction impacts on employment, temporary peak increases in employment, and indirect and induced jobs that would be supported. As described on page 4-337 of the Final EIS/EIR, most direct on-site jobs for the Proposed Action would be filled by specialized construction workers, who follow jobs geographically and stay in temporary quarters for the duration of the job. It is also noted that impacts on employment would arise not only from direct jobs, but by the goods and services required to build project facilities. The jobs most likely to lead to in-migration by persons who might remain in the area would be jobs identified as indirect or induced, totaling to a maximum of 19 in Kern County and 83 in Los Angeles County.



Comment: James Godde came in to see how the easement/purchase of property would work. He said that he has had a lot of vandalism on this piece of property and knows of other incidents near by. LADWP should be aware of this during construction and maintenence. This piece of property is fenced with 3.5ft fence. There is an existing pad about 1/3 Ac on the property with a view of the entire valley north. There is a smaller pad also. The point is a spring well that may not be visible above ground.

Date: 9/27/2011 6:44:42 PM **Comment ID:** 184441

Name: James Godde

Address 1: PO Box 6438

City: Lancaster **State:** CA **Zip Code:** 93530

Telephone: **E-mail:**

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

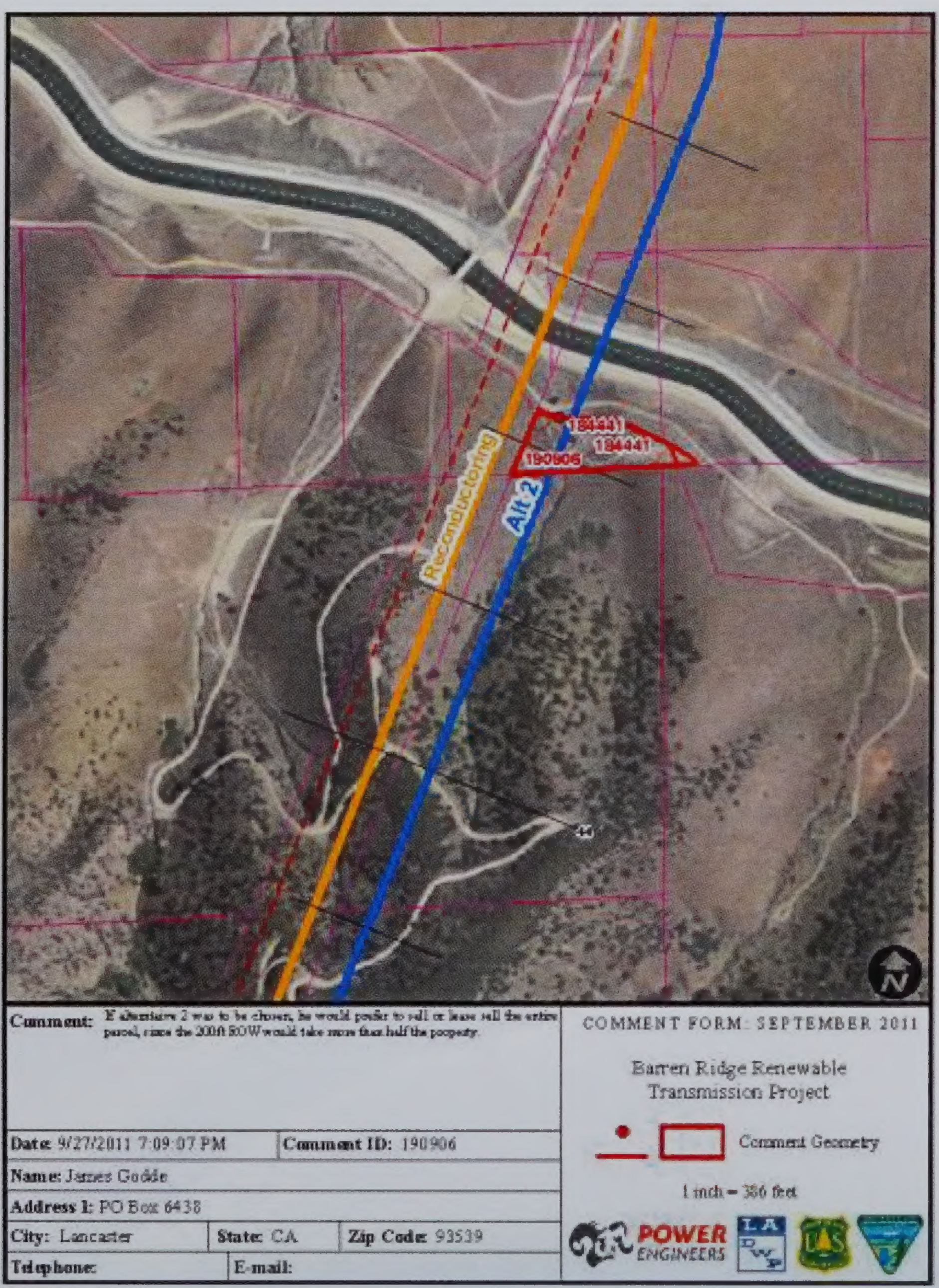
● ▭ Comment Geometry

1 inch = 125 feet

POWER ENGINEERS

AGUA DULCE PUBLIC MEETING

Agua Dulce Response 1: Your comment has been received by the BLM, USFS, and LADWP. This comment does not warrant the modification of the Proposed Action or Alternatives, the development of new alternatives, the modification of the environmental analysis, or factual corrections to the Draft EIS/EIR. This comment simply shares information with the lead agencies.



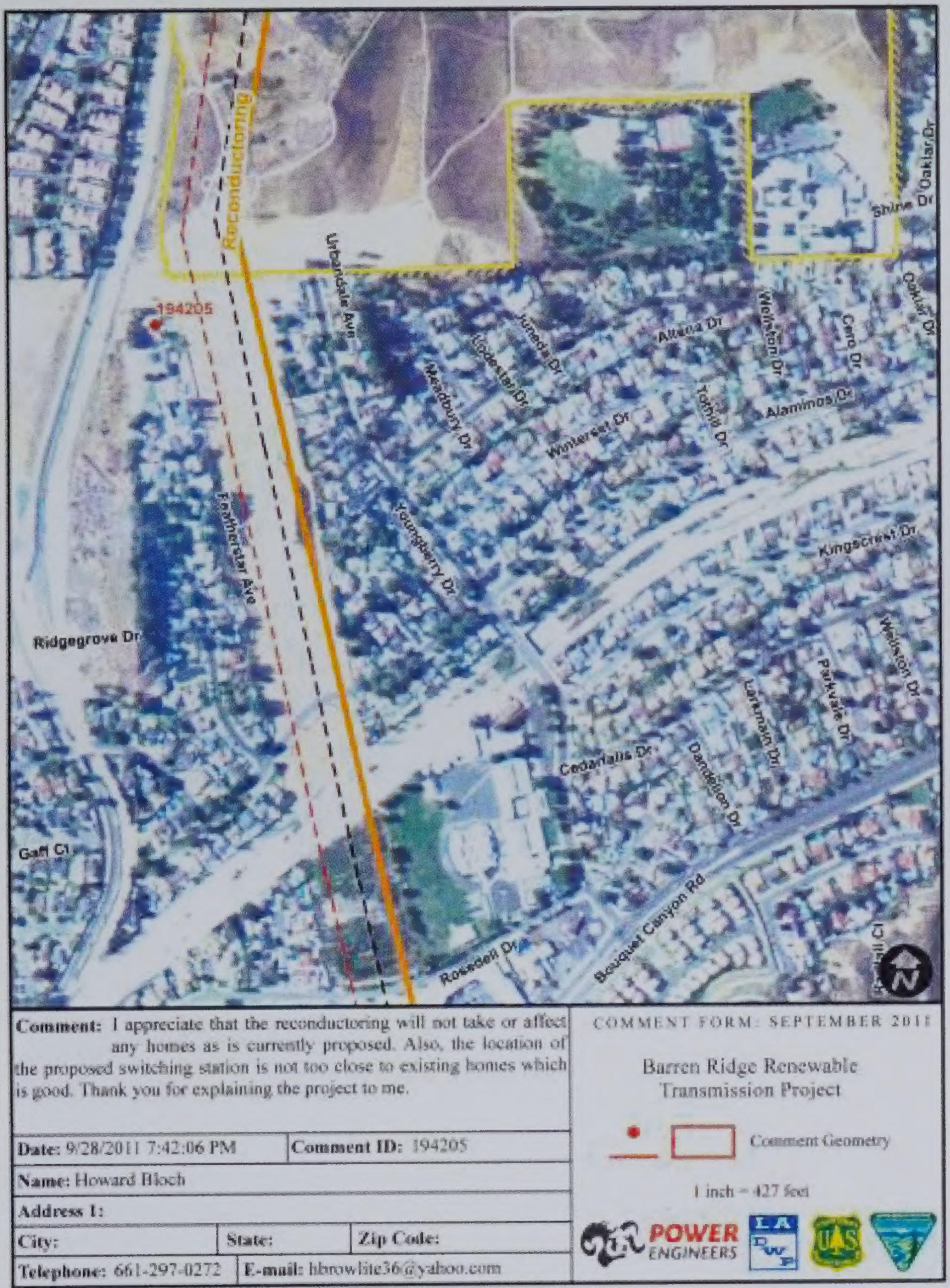
Comment: If alternative 2 was to be chosen, he would prefer to sell or lease sell the entire parcel, since the 200ft ROW would take more than half the property.		
Date: 9/27/2011 7:09:07 PM	**Comment ID:** 190906	
Name: James Godde		
Address 1: PO Box 6438		
City: Lancaster	**State:** CA	**Zip Code:** 93539
Telephone:	**E-mail:**	

Agua Dulce Response 2: If an action Alternative is selected, LADWP would begin property acquisition once a final decision has been made on the proposed Project. At that time, they would work with individual property owners and professional appraisers to agree on a fair market value as required by State law.

3. Johnson Informal Oral Comment: Ms. Johnson asked what LADWP was doing to increase the amount of solar energy in the local Los Angeles area to supply power instead of having to build transmission lines. Ms. Johnson also mentioned that fire is a major concern in Agua Dulce.

Agua Dulce Response 3: An overview of LADWP's resource mix, energy resource planning, and green energy programs is provided in the Final EIS/EIR on page 1-4. As described on page 2-13 in the Final EIS/EIR, an alternative to utilize distributed generation and in-basin generation expansion was evaluated, but was eliminated from detailed consideration because it did not meet the Project purpose and need. Your comment regarding fire as a major concern in Agua Dulce will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS and LADWP. Table 4.2.11-1 in Chapter 4 of the Final EIS/EIR details the ten mitigation measures to reduce potential impacts to wildfire and fuels; with the implementation of these mitigation measures, wildfire and fuels impacts were found to be less than significant for the Proposed Action and Alternatives.

4. Smith, L. Informal Oral Comment: Ms. Smith asked for clarification regarding right-of-way (ROW) placement and if LADWP would purchase or seek an easement for the ROW. She asked if Alternative 3 was the only Alternative that would result in


Reconductoring
194205
Urbandale Ave
Shine Dr
Oaklar Dr
Juneau Dr
Lodestar Dr
Mendoury Dr
Altana Dr
Wellston Dr
Cerro Dr
Tobria Dr
Alaminos Dr
Winterest Dr
Youngberry Dr
Feathertsar Ave
Kingscrest Dr
Ridgegrove Dr
Parkvale Dr
Lanemain Dr
Cedarfalls Dr
Dandelion Dr
Gaff Ct
Bouquet Canyon Rd
Rossdell Dr
N

Comment: I appreciate that the reconductoring will not take or affect any homes as is currently proposed. Also, the location of the proposed switching station is not too close to existing homes which is good. Thank you for explaining the project to me.

Date: 9/28/2011 7:42:06 PM **Comment ID:** 194205
Name: Howard Bloch
Address 1:
City: **State:** **Zip Code:**
Telephone: 661-297-0272 **E-mail:** hbrowlite36@yahoo.com

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

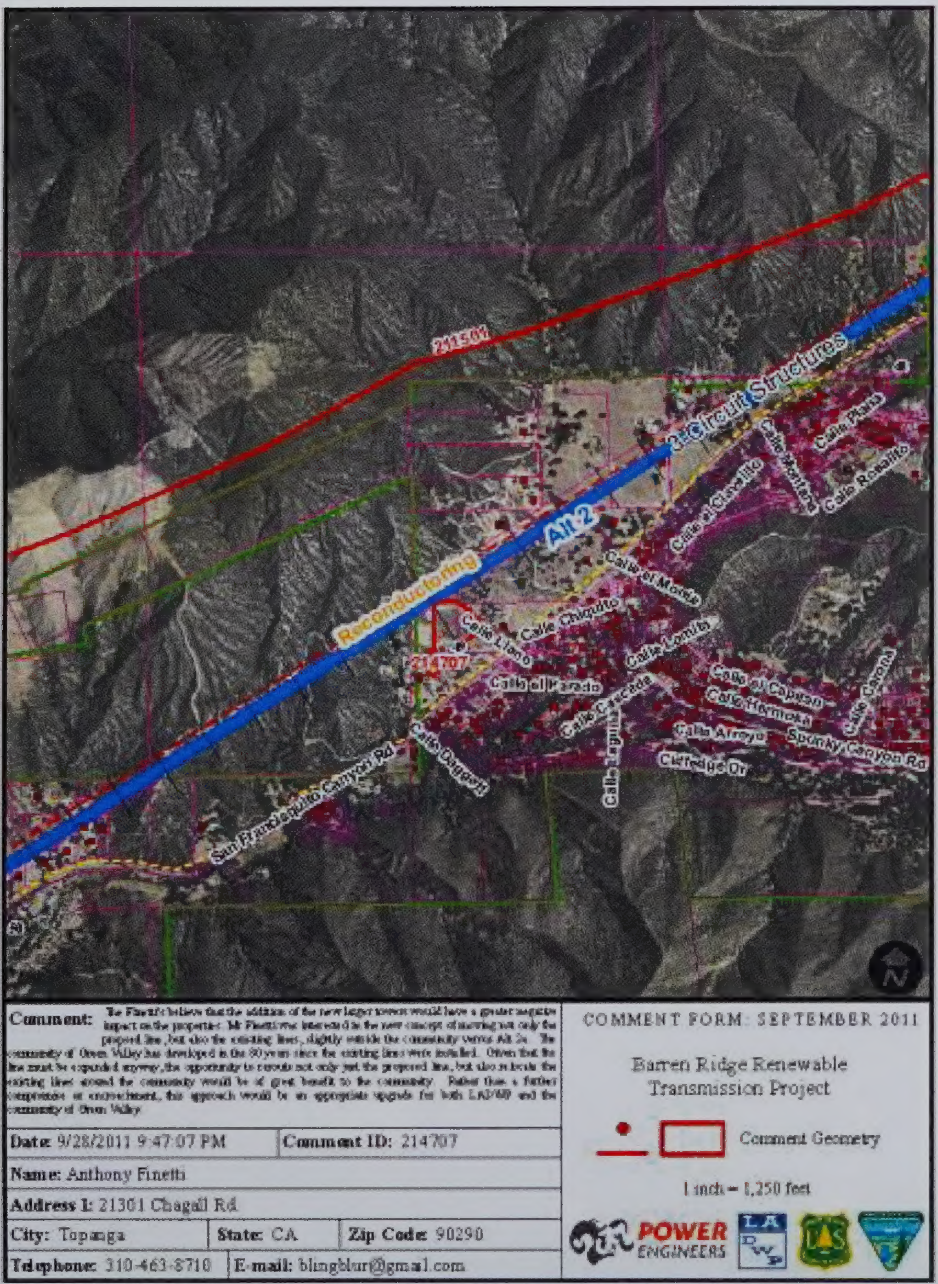
1 inch = 427 feet

taking of private residences. She also asked about undergrounding the proposed new transmission line.

Agua Dulce Response 4: Chapter 2 of the Final EIS/EIR describes in detail the Proposed Action and Alternatives, including information on existing and proposed ROW. LADWP would seek ownership in fee for the ROW on private land. Alternative 3 is the only Alternative that would result in the taking of private residences. As described on page 2-18 of the Final EIS/EIR, an alternative to utilize underground transmission was evaluated in the Draft EIS/EIR, but was eliminated from detailed consideration because it did not avoid or minimize environmental effects and was not feasible.

SANTA CLARITA PUBLIC MEETING

Santa Clarita Response 1: Your comment has been received by the BLM, USFS, and LADWP.


211501
2 Circuit Structures
Alt 2
Reconductoring
214707
Calle Plano
Calle Rosalito
Calle Suelto
Calle el Chavito
Calle el Monte
Calle Chiquito
Calle Llano
Calle Lorrita
Calle el Parado
Calle Cascada
Calle el Capitan
Calle Hermosa
Calle Cayota
Calle Arroyo
Spunky Canyon Rd
Cielito Dr
Calle Laguna
Calle Daggett
San Francisquito Canyon Rd
COMMENT FORM: SEPTEMBER 2011
Barren Ridge Renewable Transmission Project
Comment Geometry
1 inch = 1,250 feet
POWER ENGINEERS
LA DWP

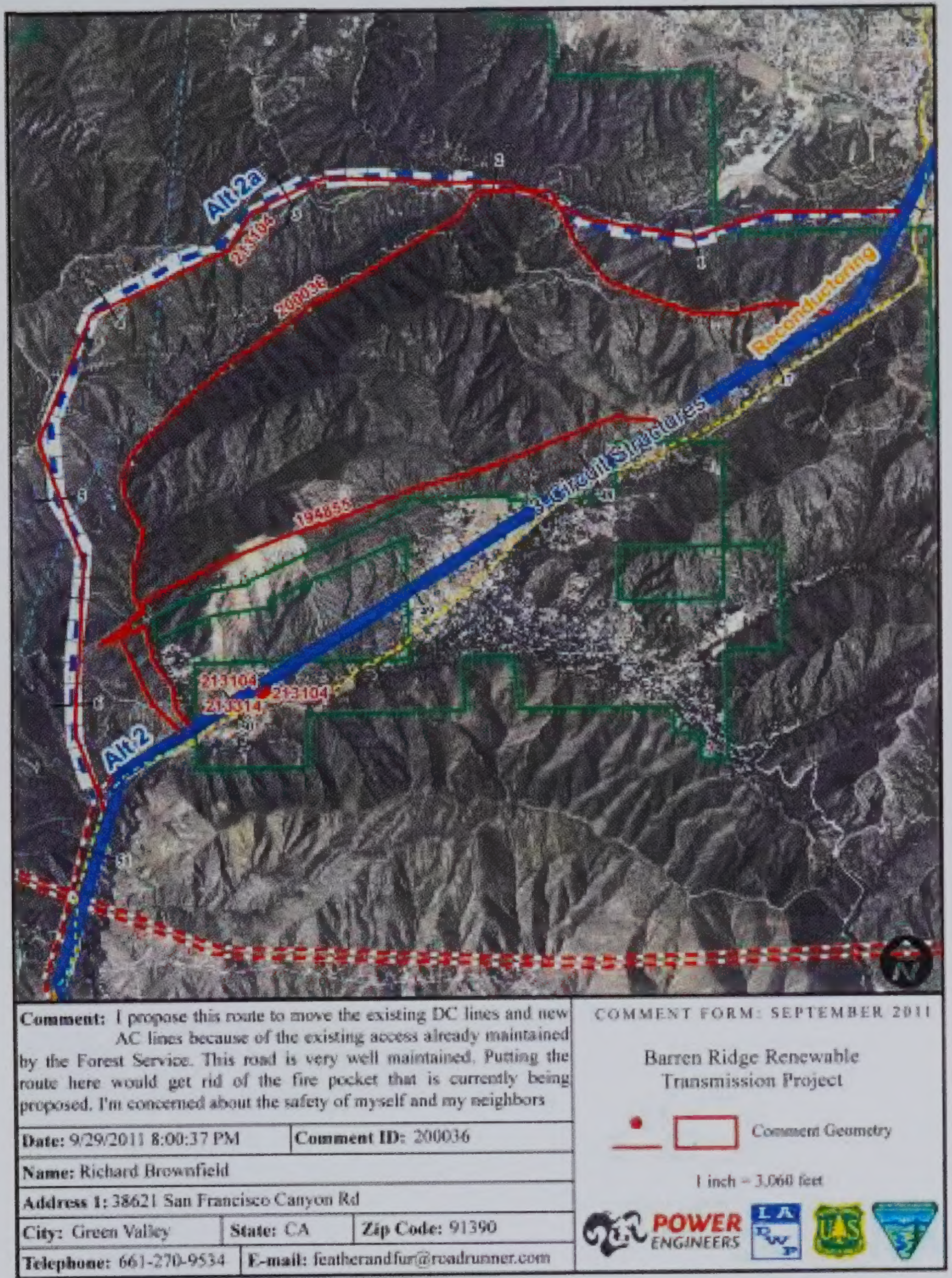
Comment:

Date: 9/28/2011 9:47:07 PM	**Comment ID:** 214707
Name: Anthony Finetti	
Address 1: 21301 Chagall Rd.	
City: Topanga | **State:** CA | **Zip Code:** 90290	
Telephone: 310-463-8710	**E-mail:** blingblur@gmail.com

Santa Clarita Response 2: Please refer to Lake Hughes Response 4. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

3. Finetti, A. Informal Oral Comment: Mr. Finetti commented that from his property in Spunky Canyon, which is adjacent to the existing 230 kV and 500 kV DC transmission lines, he can hear buzzing from the existing lines. He is also concerned about the taking of his property.

Santa Clarita Response 3: With implementation of the Three-Circuit Mitigation, described in on pages 2-79 through 2-82 of the Final EIS/EIR, the ROW would not be expanded to implement the Proposed Action adjacent to Mr. Finetti's property, and no take of Mr. Finetti's property would be necessary. The Final EIS/EIR, Chapter 3, Section 3.2.2 describes the existing noise environment, and Chapter 4, Section 4.2.2 describes the expected noise environment with the implementation of the Proposed Action or Alternatives. Significant impacts due to operational noise are not anticipated for any of the action Alternatives, mainly due to only an incremental increase in noise compared to the existing situation.



Comment: I propose this route to move the existing DC lines and new AC lines because of the existing access already maintained by the Forest Service. This road is very well maintained. Putting the route here would get rid of the fire pocket that is currently being proposed. I'm concerned about the safety of myself and my neighbors

Date: 9/29/2011 8:00:37 PM **Comment ID:** 200036
Name: Richard Brownfield
Address 1: 38621 San Francisco Canyon Rd
City: Green Valley **State:** CA **Zip Code:** 91390
Telephone: 661-270-9534 **E-mail:** featherandfur@roadrunner.com

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

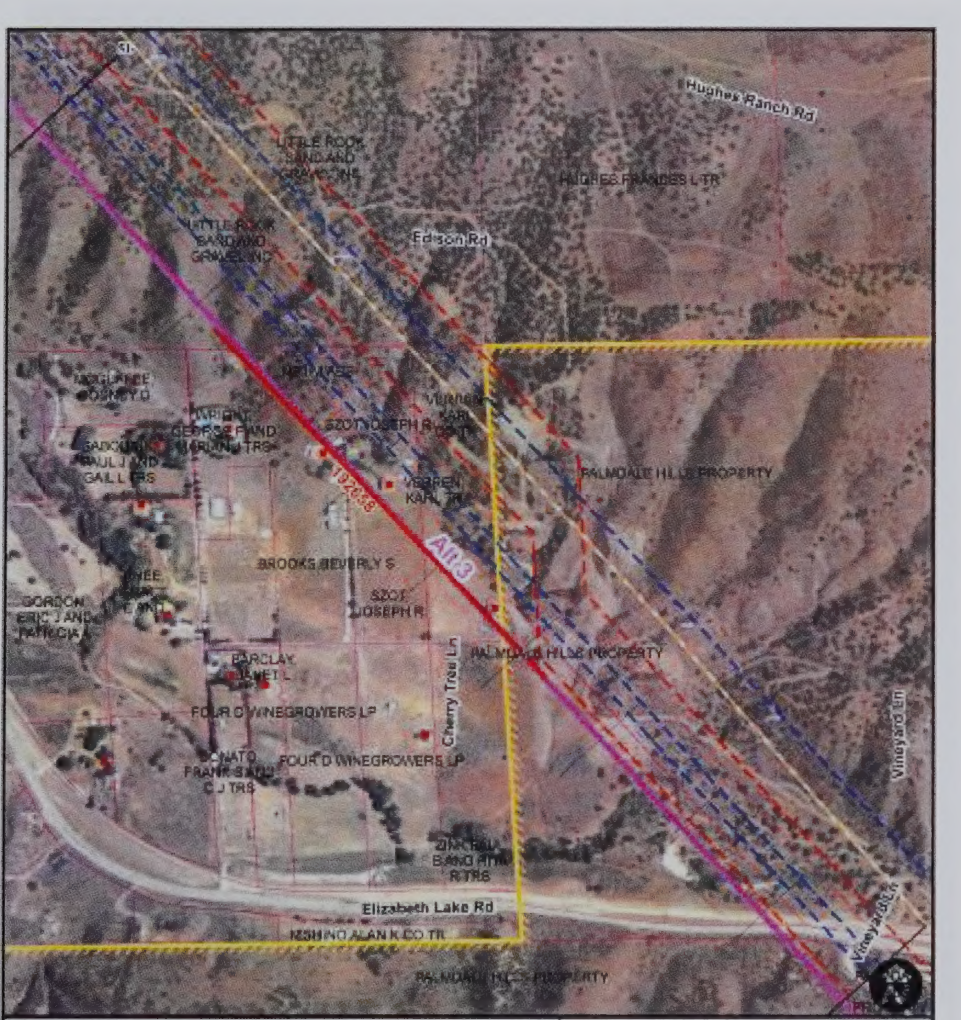
● 🟥 Comment Geometry

1 inch = 3,060 feet

POWER ENGINEERS

LEONA VALLEY PUBLIC MEETING

Leona Valley Response 1: Please refer to Lake Hughes Response 1 and Lake Hughes Response 4 regarding re-routing the proposed and existing transmission lines around the community of Green Valley. The implementation of Alternative 2a would result in a transmission-line bounded island; for this reason and others it is not identified as the Federal Agency Preferred or Environmentally Superior Alternative. Alternative 2, which has been identified as the Federal Agency Preferred and Environmentally Superior Alternative, would not result in a transmission-line bounded island, nor would Alternatives 1 or 3. Please refer to Section 4.2.11, Wildfire and Fuels, of the Final EIS/EIR for a detailed discussion of potential impacts to wildfire and fuels for each of the Alternatives. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.


Hughes Ranch Rd
LITTLE ROCK SAND AND GRAVEL INC
HUGHES FRANCES L TR
Edison Rd
LITTLE ROCK SAND AND GRAVEL INC
MCCLAFFERTY DONALD D
WRIGHT GEORGE H AND MARILYN TRS
SZOT JOSEPH R
VERREN KARL TR
SADOUSKY PAUL J AND GAIL L TRS
192658
VERREN KARL TR
PALMDALE HILLS PROPERTY
Alt 3
BROOKS BEVERLY S
SZOT JOSEPH R
GORDON ERIC J AND PATRICIA
BARCLAY JANET L
PALMDALE HILLS PROPERTY
Cherry Tree Ln
FOUR D WINEGROWERS LP
DONATO FRANK S AND C J TRS
FOUR D WINEGROWERS LP
Vineyard Ln
Elizabeth Lake Rd
MISHINO ALAN K CO TR
PALMDALE HILLS PROPERTY

Comment: It is completely unacceptable to take out homes. At a minimum, the line needs to be moved to the East. SCE already set a precedence of protecting those homes.

Date: 9/29/2011 7:26:59 PM	**Comment ID:** 192658

Name: William Elliott

Address 1: 40015 72nd St West

City: Leona Valley	**State:** CA	**Zip Code:** 93551

Telephone: 661-270-9017	**E-mail:** william.elliott@lmco.com

COMMENT FORM: SEPTEMBER 2011

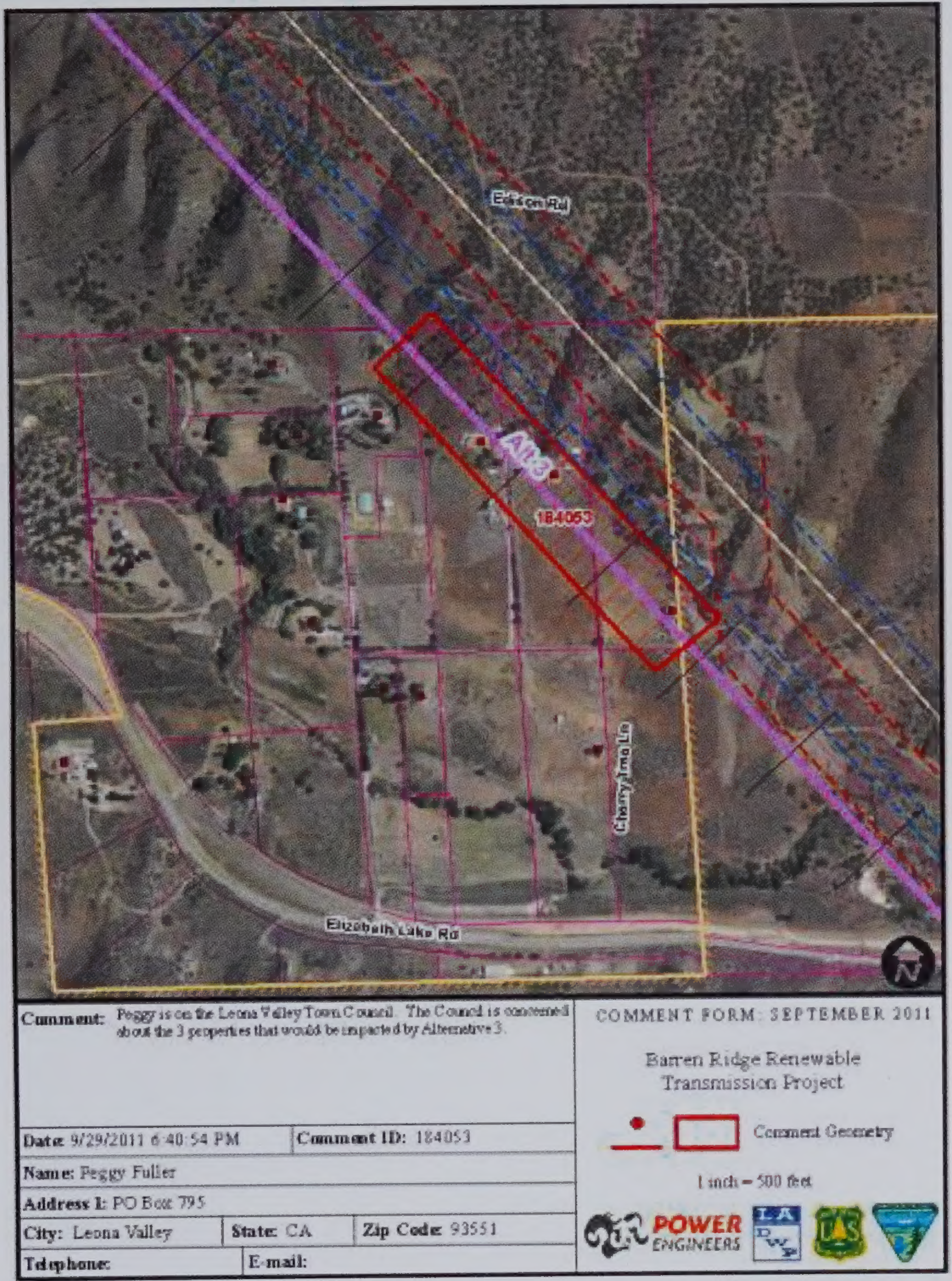
Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 548 feet

POWER ENGINEERS

Leona Valley Response 2: Alternative 3 is not the Federal Agency Preferred or the Environmentally Superior Alternative as described in Sections 2.7 and 2.8 of the Final EIS/EIR. While Alternative 3 was designed to minimize potential take of private residences (see page 2-114 in Chapter 2 of the Final EIS/EIR for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the preferred Alternative. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Comment: Peggy is on the Leona Valley Town Council. The Council is concerned about the 3 properties that would be impacted by Alternative 3.

Date: 9/29/2011 6:40:54 PM	**Comment ID:** 184053
Name: Peggy Fuller	
Address 1: PO Box 795	
City: Leona Valley	**State:** CA · **Zip Code:** 93551
Telephone:	**E-mail:**

COMMENT FORM: SEPTEMBER 2011

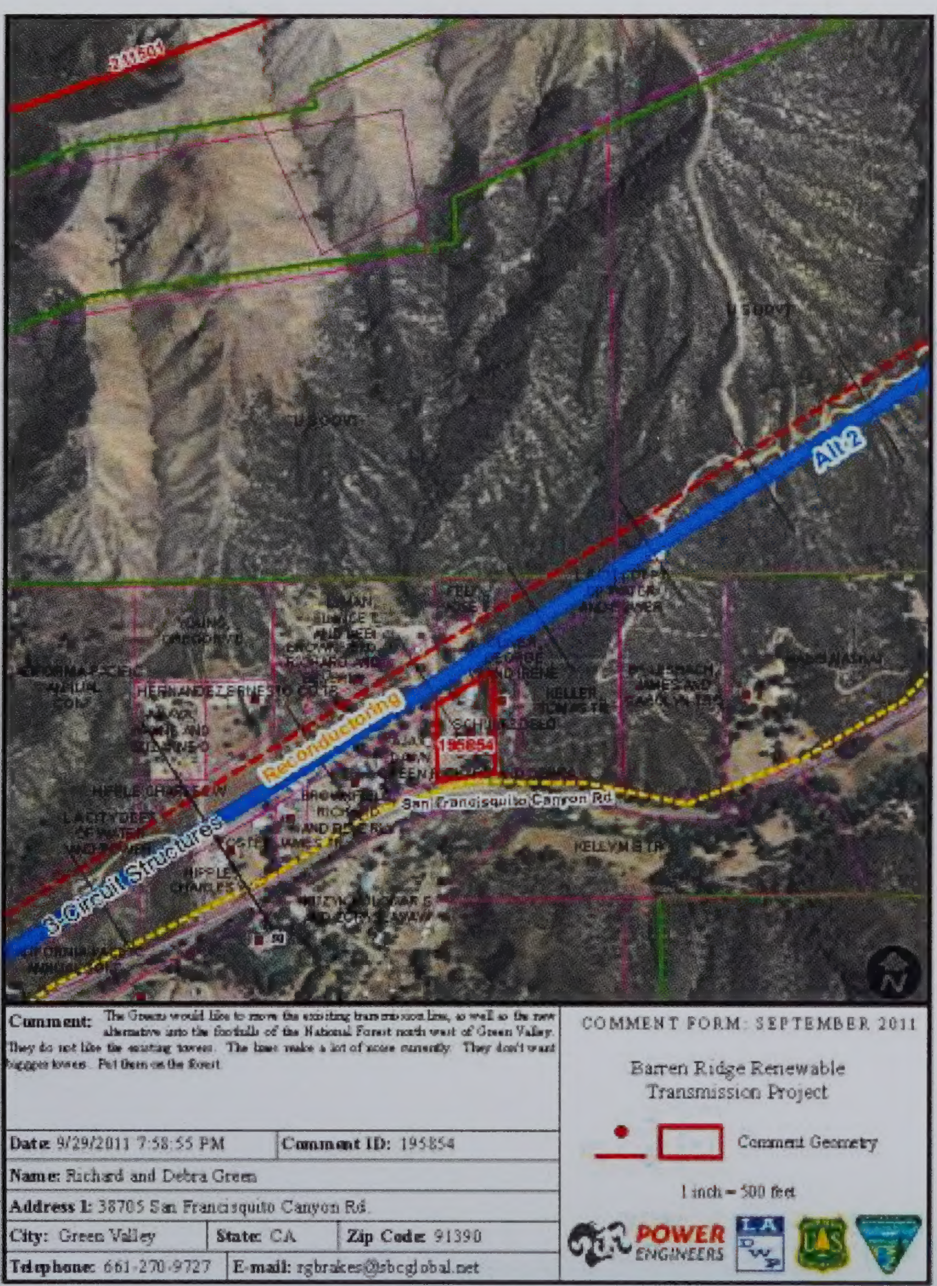
Barren Ridge Renewable
Transmission Project

Comment Geometry

1 inch = 500 feet

POWER ENGINEERS

Leona Valley Response 3: See Leona Valley Response 2. Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative. While Alternative 3 was designed to minimize potential take of private residences (see page 2-114 in Chapter 2 of the final EIS/IER for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Comment: The Greens would like to move the existing transmission line, as well as the new alternative into the foothills of the National Forest north west of Green Valley. They do not like the existing towers. The lines make a lot of noise currently. They don't want bigger towers. Put them on the forest.

Date: 9/29/2011 7:58:55 PM **Comment ID:** 195854
Name: Richard and Debra Green
Address 1: 38705 San Francisquito Canyon Rd.
City: Green Valley **State:** CA **Zip Code:** 91390
Telephone: 661-270-9727 **E-mail:** rgbrakes@sbcglobal.net

COMMENT FORM: SEPTEMBER 2011

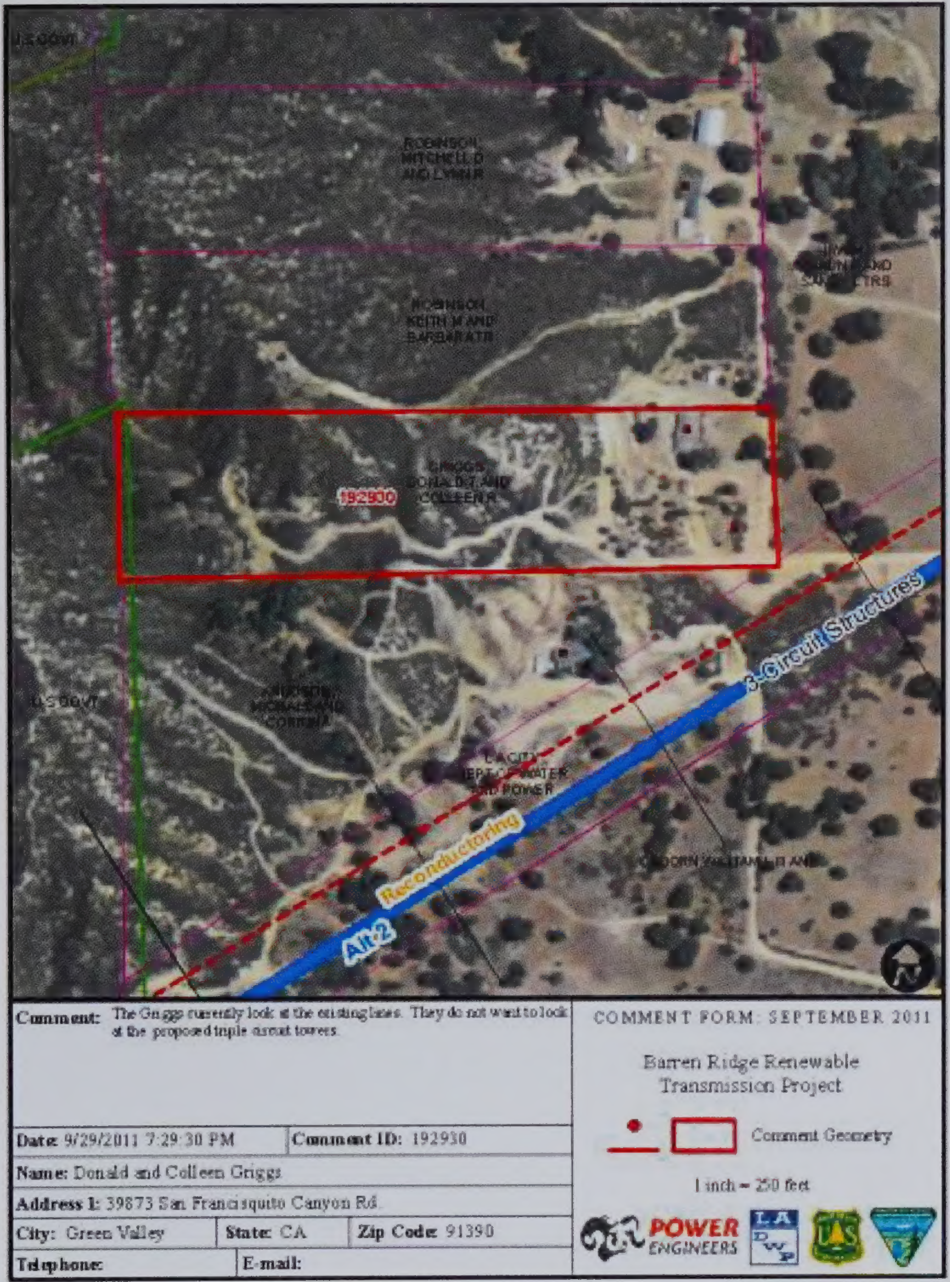
Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 500 feet

Leona Valley Response 4: Please refer to Lake Hughes Response 4 regarding re-routing the proposed and existing transmission lines around the community of Green Valley.

In the Final EIS/EIR, Chapter 3, Section 3.2.2 describes the existing noise environment, and Chapter 4, Section 4.2.2 describes the expected noise environment with the implementation of the Proposed Action or Alternatives. Significant impacts due to operational noise are not anticipated for any of the action Alternatives, because the Project would not substantially increase noise over the current levels. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.


U.S. GOVT
ROBINSON MITCHELL D AND LYNN R
ROBINSON KEITH M AND BARBARA TR
GRIGGS DONALD T AND COLLEEN R
192930
U.S. GOVT
L A CITY DEPT OF WATER AND POWER
3-Circuit Structures
Reconductoring
Alt 2

Comment: The Griggs currently look at the existing lines. They do not want to look at the proposed triple circuit towers.

Date: 9/29/2011 7:29:30 PM

Comment ID: 192930

Name: Donald and Colleen Griggs

Address 1: 39873 San Francisquito Canyon Rd.

City: Green Valley

State: CA

Zip Code: 91390

Telephone:

E-mail:

COMMENT FORM: SEPTEMBER 2011

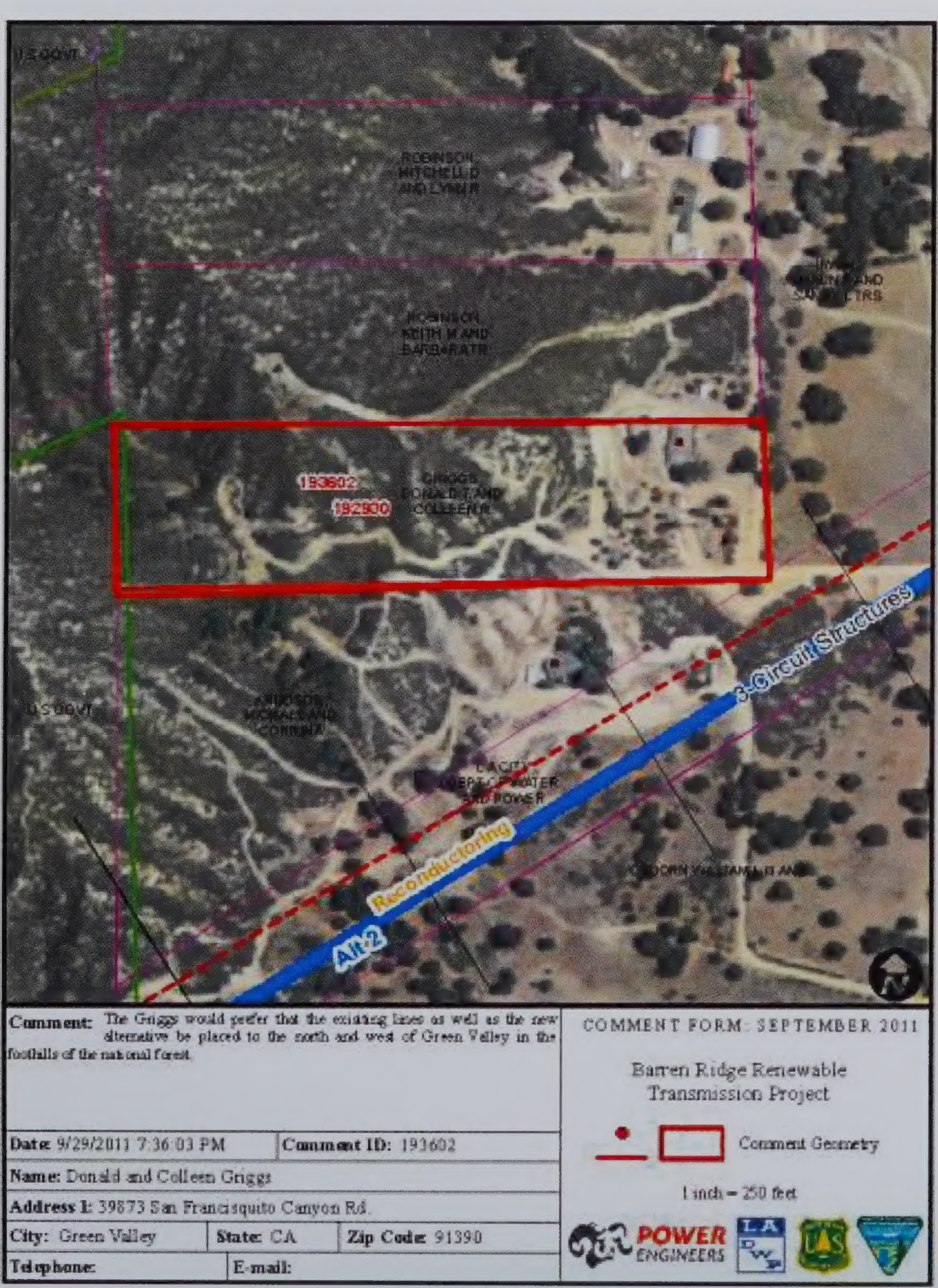
Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 250 feet

POWER ENGINEERS

Leona Valley Response 5: Please refer to Lake Hughes Response 4 regarding re-routing the proposed and existing transmission lines around the community of Green Valley. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.


U S GOVT
ROBINSON MITCHELL D AND LYNN R
ROBINSON KEITH M AND BARBARA TR
193602
192900
GRIGGS DONALD T AND COLLEEN R
U S GOVT
L A CITY DEPT OF WATER AND POWER
3-Circuit Structures
Reconductoring
Alt 2
POWER ENGINEERS

Comment: The Griggs would prefer that the existing lines as well as the new alternative be placed to the north and west of Green Valley in the foothills of the national forest.

Date: 9/29/2011 7:36:03 PM	**Comment ID:** 193602	
Name: Donald and Colleen Griggs		
Address 1: 39873 San Francisquito Canyon Rd.		
City: Green Valley	**State:** CA	**Zip Code:** 91390
Telephone:	**E-mail:**	

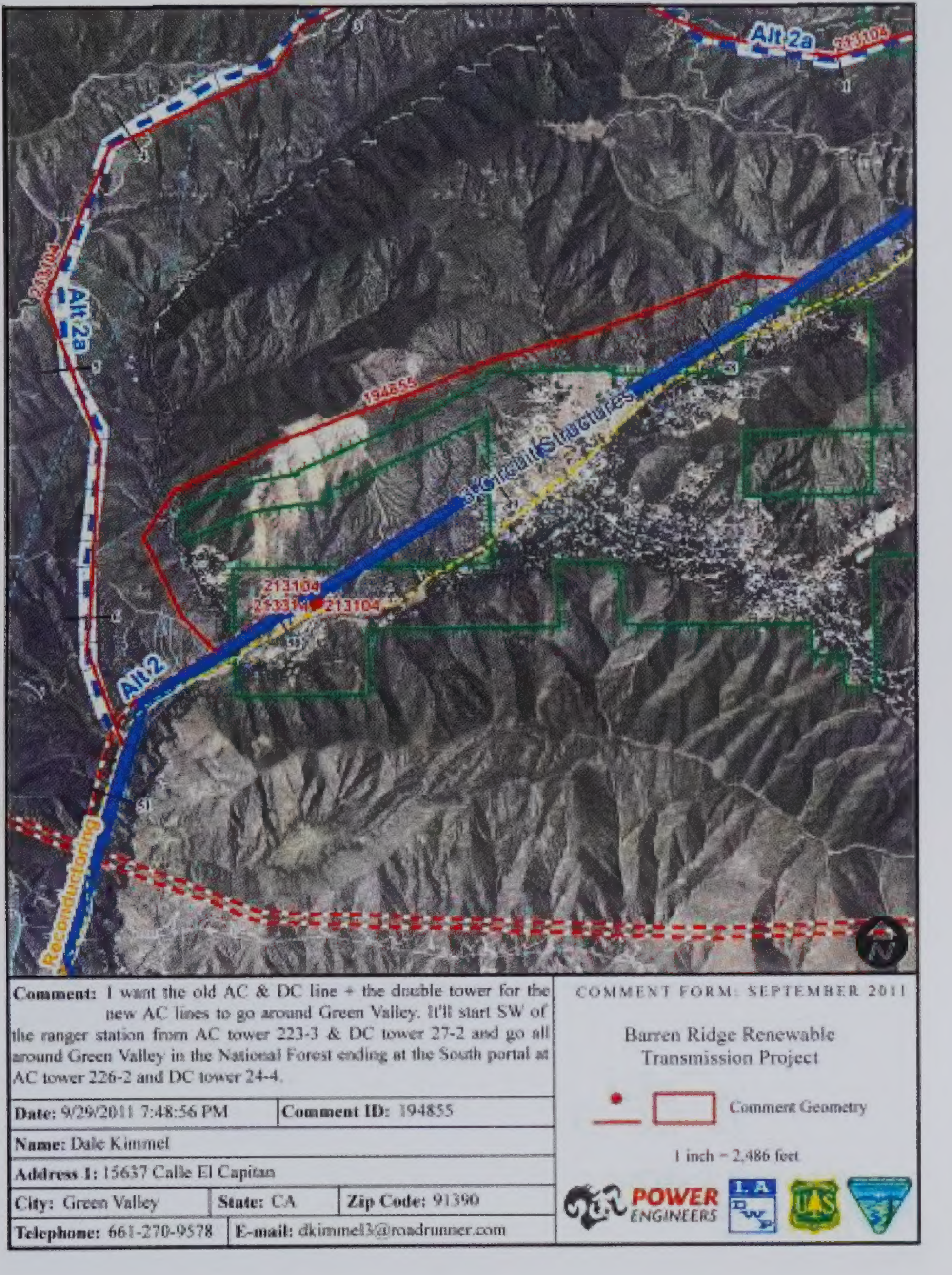
COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 250 feet

Leona Valley Response 6: Please refer to Lake Hughes Response 4 regarding re-routing the proposed and existing transmission lines around the community of Green Valley. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Comment: I want the old AC & DC line + the double tower for the new AC lines to go around Green Valley. It'll start SW of the ranger station from AC tower 223-3 & DC tower 27-2 and go all around Green Valley in the National Forest ending at the South portal at AC tower 226-2 and DC tower 24-4.

Date: 9/29/2011 7:48:56 PM **Comment ID:** 194855

Name: Dale Kimmel

Address 1: 15637 Calle El Capitan

City: Green Valley **State:** CA **Zip Code:** 91390

Telephone: 661-270-9578 **E-mail:** dkimmel3@roadrunner.com

COMMENT FORM: SEPTEMBER 2011

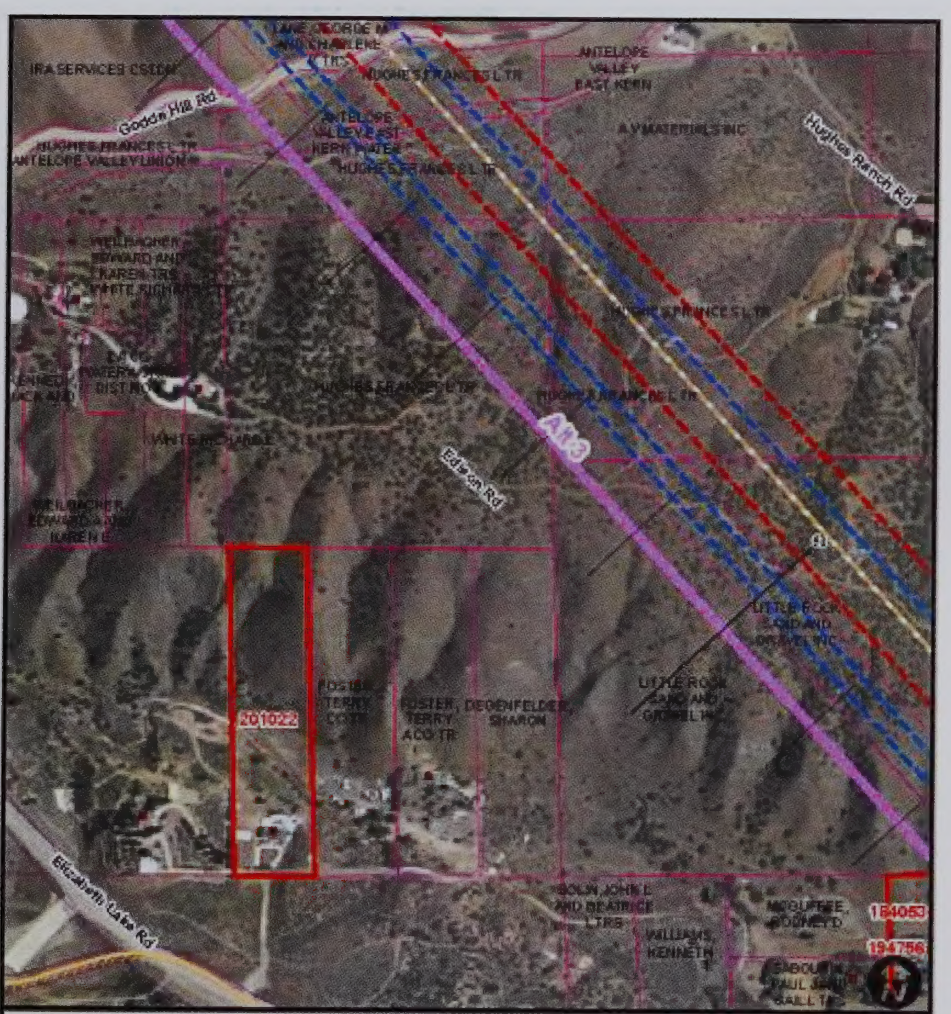
Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 2,486 feet

POWER ENGINEERS

Leona Valley Response 7: Please refer to Lake Hughes Response 4 regarding re-routing the proposed and existing transmission lines around the community of Green Valley. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.


IRA SERVICES CSTDN
Godde Hill Rd
HUGHES FRANCES L TR
ANTELOPE VALLEY UNION
HUGHES FRANCES L TR
ANTELOPE VALLEY EAST KERN WATER
ANTELOPE VALLEY EAST KERN
AV MATERIALS INC
Hughes Ranch Rd
WEILBACHER EDWARD AND KAREN TRS
WHITE RICHARD
HUGHES FRANCES L TR
Alt 3
Edison Rd
WEILBACHER EDWARD AND KAREN E
LITTLE ROCK SAND AND GRAVEL INC
201022
FOSTER TERRY COTR
FOSTER TERRY ACO TR
DEGENFELDER SHARON
BOLIN JOHN E AND BEATRICE L TRS
WILLIAMS KENNETH
MCGUFFEE RODNEY D
184053
194786
Elizabeth Lake Rd

Comment: This area cumulatively has 6 existing lines. Not only is this an intense ecological and visual impact, it is right on the San Andreas Fault. Last year the Station Fire came all the way from Acton through Ritter Ranch and surrounded these properties and continued on to Palmdale. Because this is an intense fire area, Alexis and Lloyd recommend that Alternative 3 be off the table. We moved to this rural area to escape the intensity of urban life. Now we are being forced to be enslaved by powerlines for the benefit of the cities many miles from this area. We do not believe in eminent domain for taking of properties and homes when there are alternatives which do not destroy people's lives.

Date: 9/29/2011 8:10:23 PM	**Comment ID:** 201022
Name: Alexis Upton-Krattle and Lloyd Cook	
Address 1: PO Box 738	
City: Leona Valley	**State:** CA **Zip Code:** 93551
Telephone: 661-270-0065	**E-mail:**

COMMENT FORM: SEPTEMBER 2011

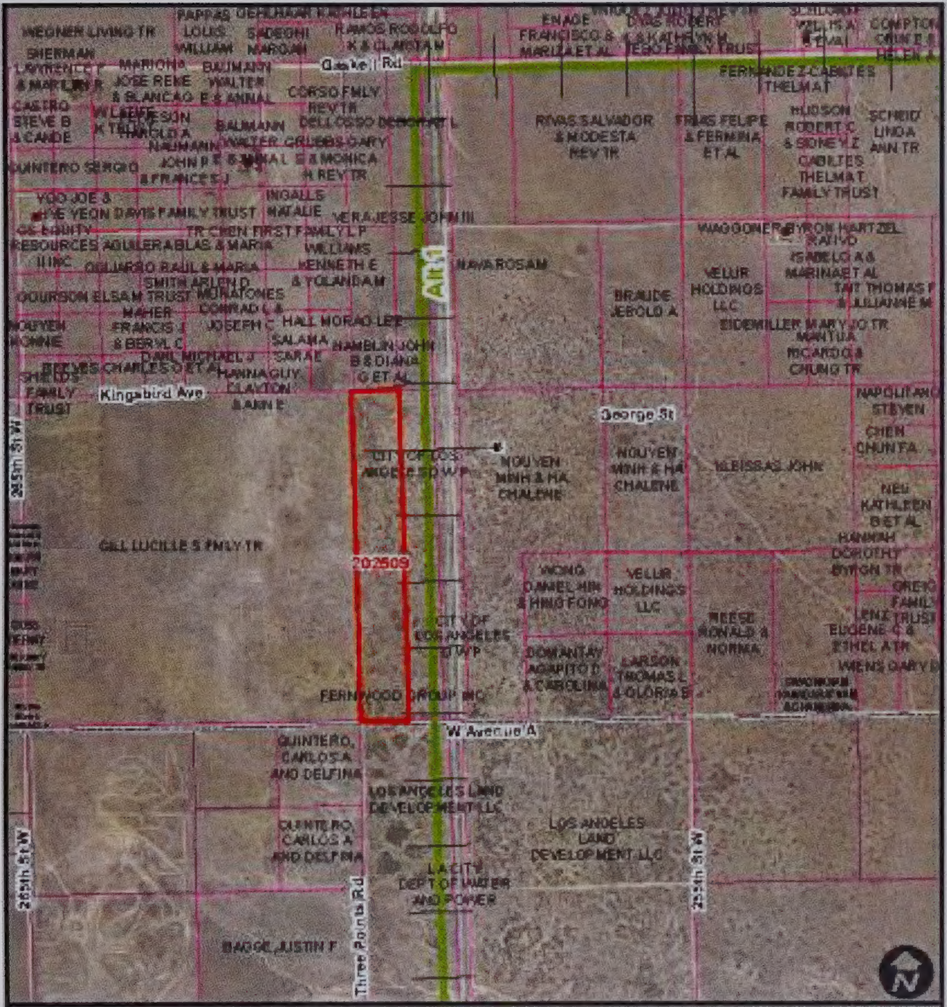
Barren Ridge Renewable
Transmission Project

Comment Geometry

1 inch = 500 feet

POWER ENGINEERS

Leona Valley Response 8: As described in Sections 2.7 and 2.8 of the Final EIS/EIR, Alternative 2 has been identified as the Federal Agency Preferred and Environmentally Superior Alternative. Alternative 3 is not the preferred Alternative due to the relatively greater magnitude of impacts associated with this Alternative. While Alternative 3 was designed to minimize potential take of private residences (see page 2-114 in Chapter 2 of the Final EIS/EIR for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. Table 4.2.11-1 in Chapter 4 of the Final EIS/EIR details the ten mitigation measures to reduce potential impacts to wildfire and fuels; with the implementation of these mitigation measures, wildfire and fuels impacts were found to be less than significant for the Proposed Action and Alternatives, including Alternative 3. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.


Gaskell Rd
Alt 1
Kingsbird Ave
George St
W Avenue A
202509
265th St W
255th St W
Three Points Rd
CITY OF LOS ANGELES DWP
FERNWOOD GROUP INC
LOS ANGELES LAND DEVELOPMENT LLC
LA CITY DEPT OF WATER AND POWER

Comment: Lloyd wanted to see where alternative 1 is compared to this piece of property that his company owns. Putting towers there where there is not any existing above ground utilities would significantly change the character and value of the property.

Date: 9/29/2011 8:25:10 PM **Comment ID:** 202509

Name: Alexis Upton-Krattle and Lloyd Cook

Address 1: PO Box 738

City: Leona Valley **State:** CA **Zip Code:** 93551

Telephone: 661-270-0065 **E-mail:**

COMMENT FORM: SEPTEMBER 2011

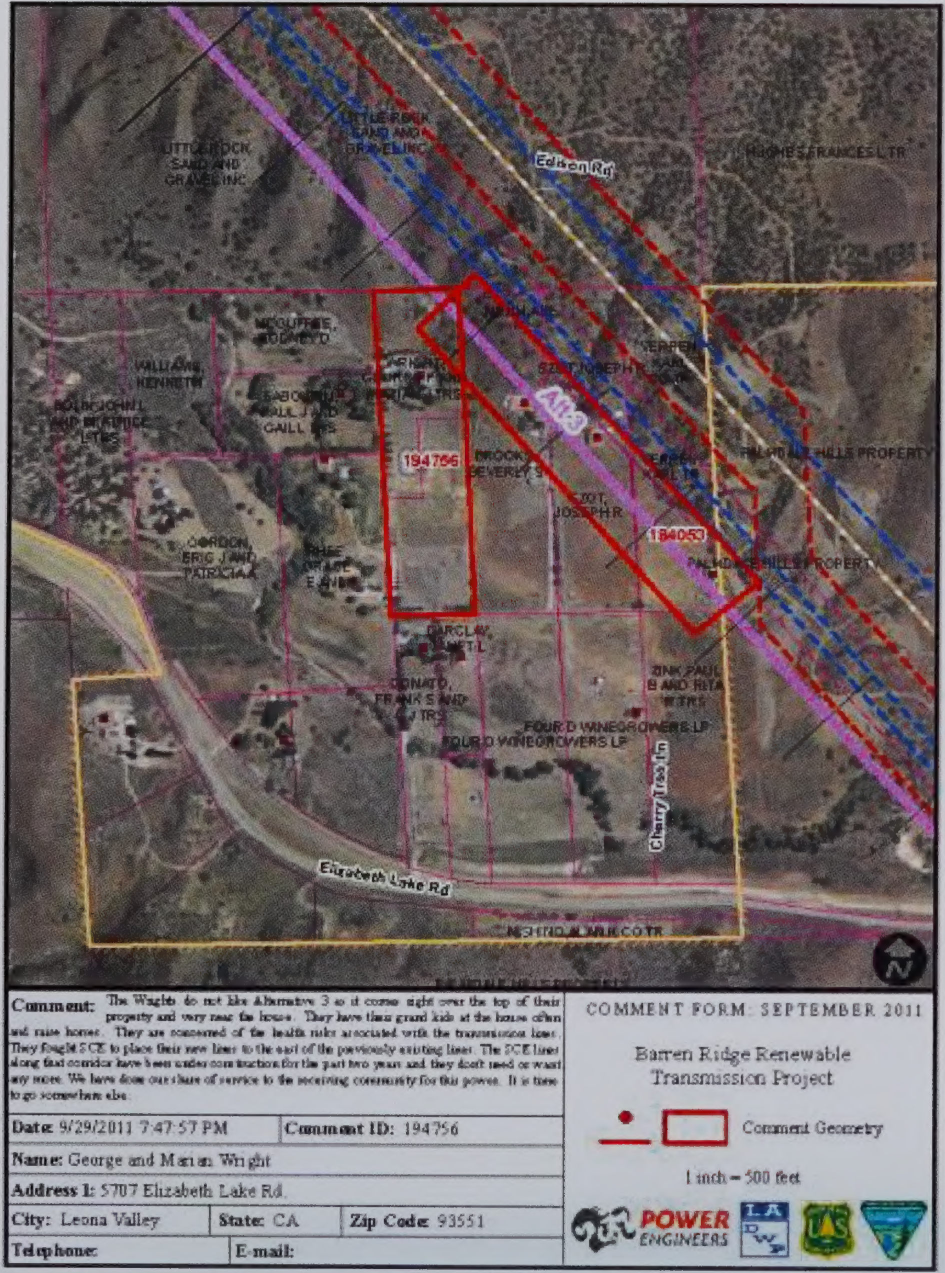
Barren Ridge Renewable
Transmission Project

Comment Geometry

1 inch = 1,000 feet

POWER ENGINEERS

Leona Valley Response 9: Chapter 4, Section 4.2.3 of the Final EIS/EIR details potential impacts to land use. As described in Chapter 4, pages 4-81 through 4-83, of the Final EIS/EIR, impacts to existing non-residential land uses for Alternative 1 would be adverse but less than significant. Chapter 4, Section 4.2.13 of the Final EIS/EIR details potential impacts to social and economic conditions. As described in Chapter 4, page 4-340, of the Final EIS/EIR, none of the action alternatives would cause a substantial reduction in property values, and impacts on property values for all action alternatives would be less than significant. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



Comment: The Wrights do not like Alternative 3 as it comes right over the top of their property and very near the house. They have their grand kids at the house often and raise horses. They are concerned of the health risks associated with the transmission lines. They fought SCE to place their new lines to the east of the previously existing lines. The SCE lines along that corridor have been under construction for the past two years and they don't need or want any more. We have done our share of service to the receiving community for this power. It is time to go somewhere else.

Date: 9/29/2011 7:47:57 PM
Comment ID: 194756
Name: George and Marian Wright
Address 1: 5707 Elizabeth Lake Rd.
City: Leona Valley
State: CA
Zip Code: 93551
Telephone:
E-mail:

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable Transmission Project

Comment Geometry

1 inch = 500 feet

Leona Valley Response 10: Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative, as described in Sections 2.7 and 2.8 of the Final EIS/EIR. While Alternative 3 was designed to minimize potential take of private residences (see Chapter 2, page 2-114, of the Final EIS/EIR for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. Chapter 4, Section 4.2.3, of the Final EIS/EIR details potential impacts to land use. As described in Chapter 4, page 4-110, of the Final EIS/EIR, although the removal of seven single-family residences would be unavoidable, LADWP would provide just compensation to property owners. It is due to the relatively greater magnitude of impacts that Alternative 3 is not the preferred Alternative. As described in Chapter 4, Section 4.2.12, of the Final EIS/EIR, because there is no consensus in the scientific community regarding health risks associated with electric and magnetic fields (EMF), conclusions cannot be reached on this subject in the Final EIS/EIR. Information regarding research on EMF associated with utility facilities is provided in Chapter 3, Section 3.2.12 of the Final EIS/EIR. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

11. Benoit, A. Informal Oral Comment: Ms. Benoit asked about payoff of mortgages of "underwater" homes taken by eminent domain. She said it would be unfair to leave people with debt after a property had been taken due to a 50 to 60 percent decline in home values in the area. She also asked about compensation for relocation of both people and livestock.

Ms. Benoit asked which projects were planned for connection to the BRRTP and asked about how cumulative projects were addressed in the Draft EIS/EIR, specifically if Southern California Edison (SCE) projects were included.

Ms. Benoit asked what portion of LADWP's mandate for renewable energy is produced within the City of Los Angeles.

Ms. Benoit asked if LADWP has a mechanism similar to a ratepayer advocate within the California Public Utilities Commission (CPUC) that could reimburse Leona Valley for expenses or if Leona Valley saved LADWP money.

Ms. Benoit asked about how much coordination occurred between LADWP and SCE in developing this Project.

Ms. Benoit commented that Leona Valley was the first California community to get the LZ-1 designation, which signified a dark nighttime environment, and asked about construction lighting and long-term lighting of the towers at night.

Leona Valley Response 11: Please refer to Chapter 2, Section 2.4.2, of the Final EIS/EIR, Right-of-Way Permits and Grants, for information regarding property acquisition. As necessary, LADWP would seek to purchase private property required for the Project. After an appraisal and inspection process, a written offer would be provided to the property owner. If an agreement could not be reached after LADWP had exhausted all opportunities to reach a settlement with the property owner, the City of Los Angeles could choose to exercise its power of eminent domain and would be required to pay fair market value for the property. There is currently no mechanism to specifically address additional payoff for properties valued at less than is owed on the mortgage. Refer to Chapter 2, Section 2.4.3, of the Final EIS/EIR for a description of the Three-Circuit Mitigation, which would be implemented for the Proposed Action to reduce various impacts including the acquisition of residential property in Willow Springs, Elizabeth Lake, and Green Valley. When necessary, relocation fees are provided by the City of Los Angeles.

Please refer to Chapter 2 of the Final EIS/EIR, Alternatives Including the Proposed Action, in its entirety for a complete description of the proposed Project. A description of LADWP's planning and approval process for interconnection customers has been added to in Chapter 2 on page 2-93 of the Final EIS/EIR. Potential effects of cumulative projects, including SCE projects, are described in Chapter 5, Cumulative Effects.

Approximately 4% of LADWP's mandate for renewable energy is provided by in-basin resources.

LADWP does not currently have a mechanism similar to a ratepayer advocate that could reimburse local communities for expenses or for potential savings provided to the utility. LADWP is a municipal utility; therefore, such requests could be directed to the Board of Water and Power Commissioners or to the Los Angeles City Council.

LADWP and the federal lead agencies did coordinate with SCE during the early development of this Project, and coordination between the utilities continues per each utility's standard practices.

The potential effects of nighttime lighting, during both construction and operation, are addressed in Section 4.2.9, Visual Resources, of the Final EIS/EIR.

12. Reitano Informal Oral Comment: Mr. Reitano explained a previous experience with SCE using eminent domain to take his property and asked about LADWP's process of eminent domain. He asked for clarification if construction could begin on the line before people have received their money.

Mr. Reitano asked about the impacts of Alternative 2a.

Leona Valley Response 12: Please refer to Chapter 2, Section 2.4.2, of the Final EIS/EIR, Right-of-Way Permits and Grants, regarding property acquisition. LADWP would not have the right to begin construction on a property prior to acquisition.

The specific potential impacts of Alternative 2a are described in Chapter 4, Environmental Impacts, of the Final EIS/EIR.

13. Elliot Informal Oral Comment: Mr. Elliot asked if LADWP would seek an easement over private property rather than ownership in fee. Mr. Elliot also asked what would happen if lines transected a property and made the remnant parcels useless.

Leona Valley Response 13: LADWP's practice is to seek ownership in fee for ROW on private property. If eminent domain were used to take a property, only the portion of the parcel required for the ROW could be acquired, but it is possible that LADWP would purchase remnant parcels from a willing seller through individual negotiations.

14. Kennedy Informal Oral Comment: Ms. Kennedy asked if off-highway vehicle (OHV) access and horseback rider access would be allowed in the new corridors, and if the Pacific Crest Trail (PCT) would be impacted. Ms. Kennedy also asked about easements over the corridor in the case that an existing parcel is bisected by a new corridor.

Leona Valley Response 14: Impacts to recreation, including OHV access, equestrian access, and the PCT, are discussed in detail in Section 4.2.5, Recreation, of the Final EIS/EIR.

All Alternatives would cause at least short-term impacts to OHV use and the PCT. For the Federal Agency Preferred Alternative (Alternative 2) on ANF lands, OHV and PCT access may be impacted in the short term by construction activities. Existing recreational uses would be maintained after construction, with incremental long-term visual impacts from the increased size of the three-circuit towers compared to the existing towers. On federal lands, compatible uses including recreation would be allowed within the proposed easements. On private land, in the case that an existing parcel would be bisected by the ROW, individual easements for access through the ROW could be negotiated with LADWP.

15. Pearcy Informal Oral Comment: Mr. Pearcy asked about the decommissioning process, and if the lines would be removed at that time.

Leona Valley Response 15: Decommissioning at the end of the useful life of the Project, as described on page 2-96 of the Final EIS/EIR, would include dismantling of conductors, insulators, and hardware and removal of tower structures in accordance with applicable current rules and regulations.

16. Finetti Informal Oral Comment: Mr. Finetti expressed that he was in favor of the Green Valley Re-Route.

Leona Valley Response 16: Please refer to Lake Hughes Response 4. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

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PART 2: SETS OF COMMENTS FROM AGENCIES, ORGANIZATIONS AND TRIBES AND RESPONSES

Part two of this appendix contains all agency, organization, and Tribe comment letters received during the public comment period, as well as four additional comment letters received from agencies and a Tribe between the close of the public comment period and November 7, 2011. The comment letters are lettered alphabetically and responses are labeled accordingly. For example, Response A-1 refers to the response to the first comment in comment letter A.

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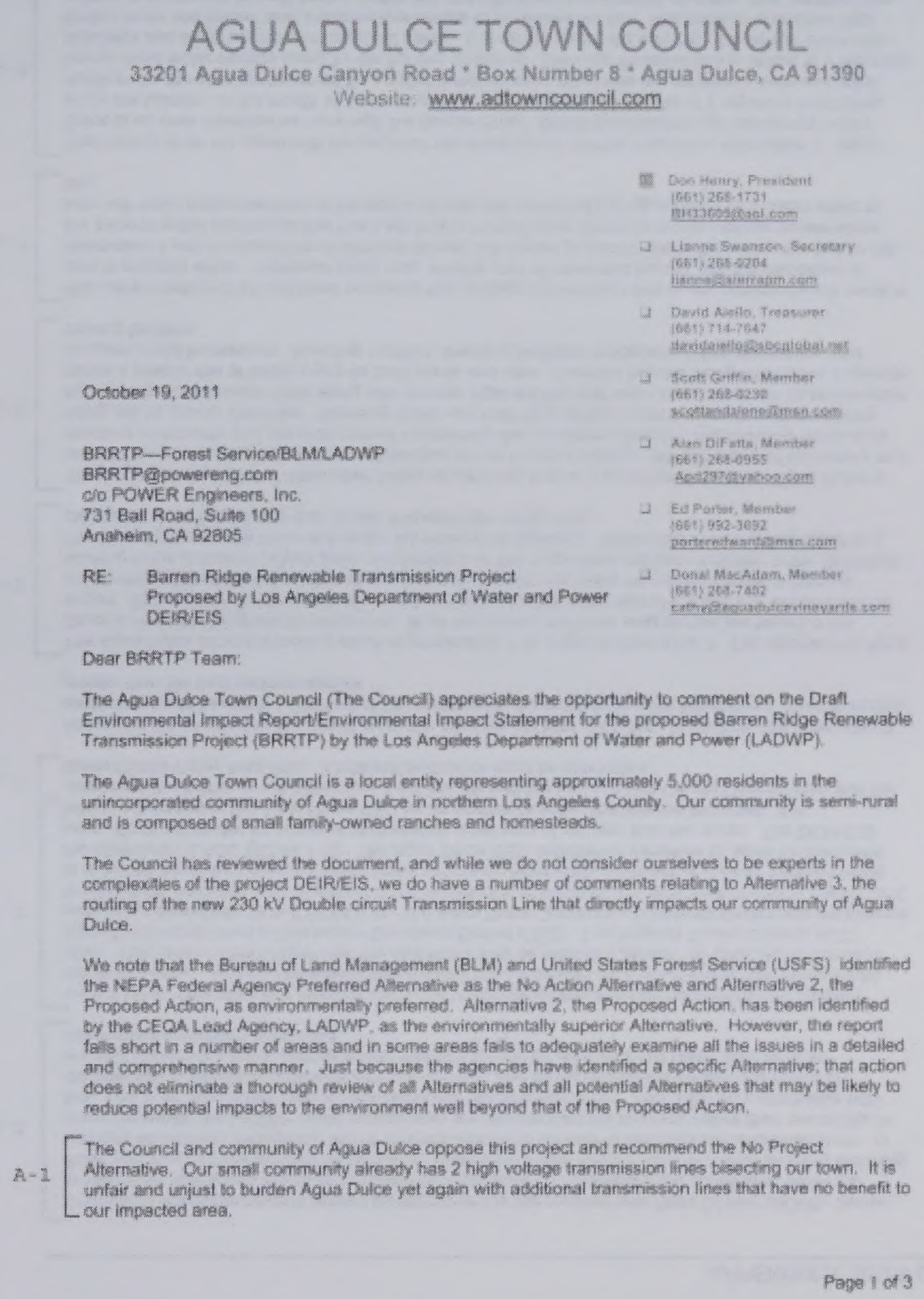

AGUA DULCE TOWN COUNCIL
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October 19, 2011

BRRTP—Forest Service/BLM/LADWP
BRRTP@powereng.com
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

RE: Barren Ridge Renewable Transmission Project
Proposed by Los Angeles Department of Water and Power
DEIR/EIS

Dear BRRTP Team:

The Agua Dulce Town Council (The Council) appreciates the opportunity to comment on the Draft Environmental Impact Report/Environmental Impact Statement for the proposed Barren Ridge Renewable Transmission Project (BRRTP) by the Los Angeles Department of Water and Power (LADWP).

The Agua Dulce Town Council is a local entity representing approximately 5,000 residents in the unincorporated community of Agua Dulce in northern Los Angeles County. Our community is semi-rural and is composed of small family-owned ranches and homesteads.

The Council has reviewed the document, and while we do not consider ourselves to be experts in the complexities of the project DEIR/EIS, we do have a number of comments relating to Alternative 3, the routing of the new 230 kV Double circuit Transmission Line that directly impacts our community of Agua Dulce.

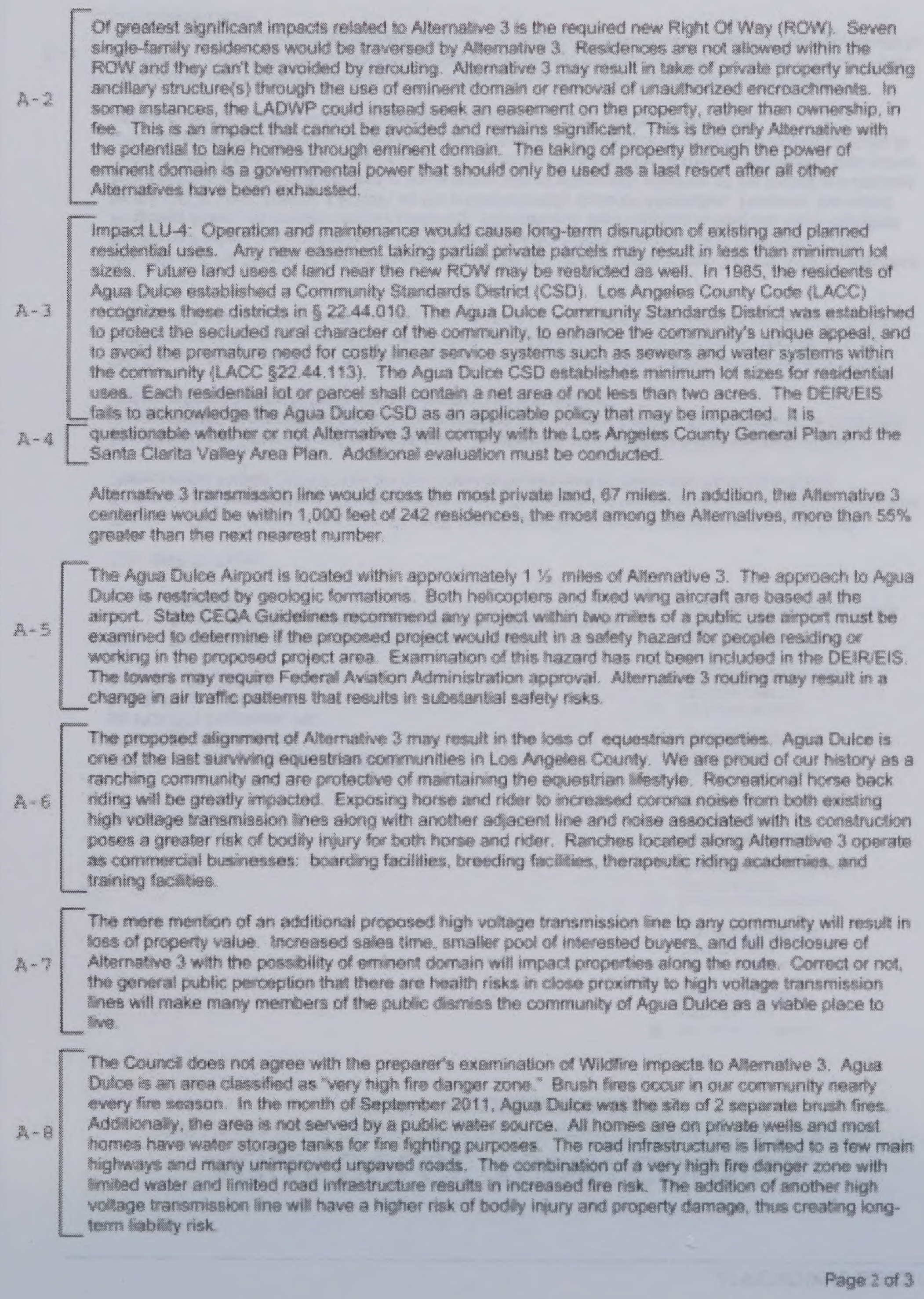
We note that the Bureau of Land Management (BLM) and United States Forest Service (USFS) identified the NEPA Federal Agency Preferred Alternative as the No Action Alternative and Alternative 2, the Proposed Action, as environmentally preferred. Alternative 2, the Proposed Action, has been identified by the CEQA Lead Agency, LADWP, as the environmentally superior Alternative. However, the report falls short in a number of areas and in some areas fails to adequately examine all the issues in a detailed and comprehensive manner. Just because the agencies have identified a specific Alternative; that action does not eliminate a thorough review of all Alternatives and all potential Alternatives that may be likely to reduce potential impacts to the environment well beyond that of the Proposed Action.

A-1 The Council and community of Agua Dulce oppose this project and recommend the No Project Alternative. Our small community already has 2 high voltage transmission lines bisecting our town. It is unfair and unjust to burden Agua Dulce yet again with additional transmission lines that have no benefit to our impacted area.

Page 1 of 3

LETTER A: AGUA DULCE TOWN COUNCIL

Response A-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. This comment does not warrant the modification of the Proposed Action or Alternatives, the development of new alternatives, the modification of the environmental analysis, or factual corrections to the Draft EIS/EIR. This comment simply expresses an opinion.



A-2 Of greatest significant impacts related to Alternative 3 is the required new Right Of Way (ROW). Seven single-family residences would be traversed by Alternative 3. Residences are not allowed within the ROW and they can't be avoided by rerouting. Alternative 3 may result in take of private property including ancillary structure(s) through the use of eminent domain or removal of unauthorized encroachments. In some instances, the LADWP could instead seek an easement on the property, rather than ownership, in fee. This is an impact that cannot be avoided and remains significant. This is the only Alternative with the potential to take homes through eminent domain. The taking of property through the power of eminent domain is a governmental power that should only be used as a last resort after all other Alternatives have been exhausted.

A-3 Impact LU-4: Operation and maintenance would cause long-term disruption of existing and planned residential uses. Any new easement taking partial private parcels may result in less than minimum lot sizes. Future land uses of land near the new ROW may be restricted as well. In 1985, the residents of Agua Dulce established a Community Standards District (CSD). Los Angeles County Code (LACC) recognizes these districts in § 22.44.010. The Agua Dulce Community Standards District was established to protect the secluded rural character of the community, to enhance the community's unique appeal, and to avoid the premature need for costly linear service systems such as sewers and water systems within the community (LACC §22.44.113). The Agua Dulce CSD establishes minimum lot sizes for residential uses. Each residential lot or parcel shall contain a net area of not less than two acres. The DEIR/EIS fails to acknowledge the Agua Dulce CSD as an applicable policy that may be impacted. A-4 It is questionable whether or not Alternative 3 will comply with the Los Angeles County General Plan and the Santa Clarita Valley Area Plan. Additional evaluation must be conducted.

Alternative 3 transmission line would cross the most private land, 67 miles. In addition, the Alternative 3 centerline would be within 1,000 feet of 242 residences, the most among the Alternatives, more than 55% greater than the next nearest number.

A-5 The Agua Dulce Airport is located within approximately 1 ½ miles of Alternative 3. The approach to Agua Dulce is restricted by geologic formations. Both helicopters and fixed wing aircraft are based at the airport. State CEQA Guidelines recommend any project within two miles of a public use airport must be examined to determine if the proposed project would result in a safety hazard for people residing or working in the proposed project area. Examination of this hazard has not been included in the DEIR/EIS. The towers may require Federal Aviation Administration approval. Alternative 3 routing may result in a change in air traffic patterns that results in substantial safety risks.

A-6 The proposed alignment of Alternative 3 may result in the loss of equestrian properties. Agua Dulce is one of the last surviving equestrian communities in Los Angeles County. We are proud of our history as a ranching community and are protective of maintaining the equestrian lifestyle. Recreational horse back riding will be greatly impacted. Exposing horse and rider to increased corona noise from both existing high voltage transmission lines along with another adjacent line and noise associated with its construction poses a greater risk of bodily injury for both horse and rider. Ranches located along Alternative 3 operate as commercial businesses: boarding facilities, breeding facilities, therapeutic riding academies, and training facilities.

A-7 The mere mention of an additional proposed high voltage transmission line to any community will result in loss of property value. Increased sales time, smaller pool of interested buyers, and full disclosure of Alternative 3 with the possibility of eminent domain will impact properties along the route. Correct or not, the general public perception that there are health risks in close proximity to high voltage transmission lines will make many members of the public dismiss the community of Agua Dulce as a viable place to live.

A-8 The Council does not agree with the preparer's examination of Wildfire impacts to Alternative 3. Agua Dulce is an area classified as "very high fire danger zone." Brush fires occur in our community nearly every fire season. In the month of September 2011, Agua Dulce was the site of 2 separate brush fires. Additionally, the area is not served by a public water source. All homes are on private wells and most homes have water storage tanks for fire fighting purposes. The road infrastructure is limited to a few main highways and many unimproved unpaved roads. The combination of a very high fire danger zone with limited water and limited road infrastructure results in increased fire risk. The addition of another high voltage transmission line will have a higher risk of bodily injury and property damage, thus creating long-term liability risk.

Response A-2: Alternative 3 is not the Federal Agency Preferred or the Environmentally Superior Alternative as described in Sections 2.7 and 2.8 of the Final EIS/EIR. While Alternative 3 was designed to minimize potential take of private residences (see page 2-114 in Chapter 2 of the Final EIS/EIR for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the preferred Alternative. Chapter 4, Section 4.2.3 of the Final EIS/EIR details potential impacts to land use. Refer to Chapter 4, page 4-107, of the Final EIS/EIR for the discussion of potential impacts to existing residential land uses for Alternative 3. Your comments regarding Alternative 3 will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response A-3: The Agua Dulce Community Standards District Regulations are not applicable to the BRRTP because BRRTP, as a municipal utility project, would not be subject to the provisions and requirements of the Los Angeles County Zoning Ordinance. Therefore, the LADWP would not be required to file for approval of a Conditional Use Permit or any other zoning permit issued by the County of Los Angeles. Please refer to Chapter 2, Section 2.4.2 of the Final EIS/EIR, Right-of-Way Permits and Grants, regarding property acquisition. For discussion of the potential impacts of eminent domain, please refer to Chapter 4, Section 4.2.3 of the Final EIS/EIR, Land Use.

Response A-4:,It was determined that Alternative 3 would not conflict with land use policies of the Los Angeles County General Plan as described in Chapter 4, Section 4.2.3, Land Use, Table 4.2.3-3 on page 4-89 of the Final EIS/EIR.

Response A-5: As presented in Appendix D of the Final EIS/EIR, Regulatory Framework (Section D.5, Land Use), Federal Aviation Regulation (FAR) Title 14, Part 77 establishes the standards for determining obstructions in navigable airspace, including height limitations on structures taller than 200 feet or within 20,000 feet (3.79 miles) of an airport. A discussion of the implementation of these FAA requirements has been added to description of the Proposed Action in Chapter 2, Section 2.4,2, page 2-76 of the Final EIS/EIR, and potential impacts are discussed in Chapter 4, Section 4.2.1, Air Quality, Section 4.22, Noise, Section 4.29, Visual Resources, and Section 4.3.1, Biological Resources. Public and private airports in the vicinity of Alternative 3 are discussed in Chapter 4, Section 4.2.3, page 4-109 of the Final EIS/EIR. While installation activities would be expected to temporarily affect aircraft movement, impacts would be expected to be adverse but less than significant. In addition, before the start of construction, LADWP would consult with the Los Angeles County Sheriff Department, the USFS, and the Los Angeles County Airport Land Use Commission regarding Alternative 3's potential conflicts with local aircraft operations or associated safety provisions.

Response A-6: Impacts related to trails along Alternative 3 are discussed in Chapter 4, Section 4.2.5 of the Final EIS/EIR, Recreation. Transmission lines located along or crossing trails would not preclude the use of these trails for equestrian activities, as the required clearance for the transmission conductors would not prevent a horse and rider from passing beneath. Furthermore, in the "Transmission Line Studies Priest Rapids Project FERC No. 2114 Final Report" prepared for Public Utility District No. 2 of Grant County, Washington, in April 2001 by Duke Engineering & Services, a review of available literature on the effects of exposure to EMF on wildlife was conducted (Duke Engineering and Services 2001). Within this document, Section 3.3 explains that "Mammals and birds are often attracted to transmission line rights-of-way for the different foraging vegetation types available (Lee et al. 1996). During observations of large mammal interactions under a 500-kV transmission line in Idaho, Goodwin (1975, as cited in Lee et.al. 1996) found no visible effects of the electric and magnetic fields on deer or elk movements."

In Section 3.4 of the "Transmission Line Studies Priest Rapids Project FERC No. 2114 Final Report," Amstutz and Miller (1980) found no evidence of adverse effects on the health or behavior of cattle, sheep, pigs, and horses living under 765 kV transmission lines. Section 4.0 of the same report concludes that the "[b]ehavior patterns exhibited in laboratory animals indicate EMFs can be felt, but that field influences are too weak to alter activities... There is little evidence to suggest that EMF radiation produces any adverse affects on wildlife biology or behavior." Based on the research presented above, it is not anticipated that equestrian activities would be impacted due to the transmission line, as EMF would not be expected to change the behavior of the horses dramatically enough to cause bodily injury to itself or any riders.

Corona noise produced by the transmission lines would result in a sustained, low-frequency humming sound, as described in Chapter 3, Section 3.2.2 of the Final EIS/EIR, Noise. This type of noise would result in sound levels of 40 or 50 A-weighted decibels (dBA) at the edge of the transmission line ROW, which would be similar to a fairly quiet refrigerator, washing machine, or clothes dryer. This type of sustained sound would not be expected to startle or alarm a horse, resulting in bodily injury; however, the responsiveness of an animal to external conditions such as these would vary by individual animal, and therefore we cannot be certain that no horse would have a negative reaction resulting in bodily injury.

Impacts to these businesses are addressed in Chapter 4, Section 4.2.3 of the Final EIS/EIR, Land Use.

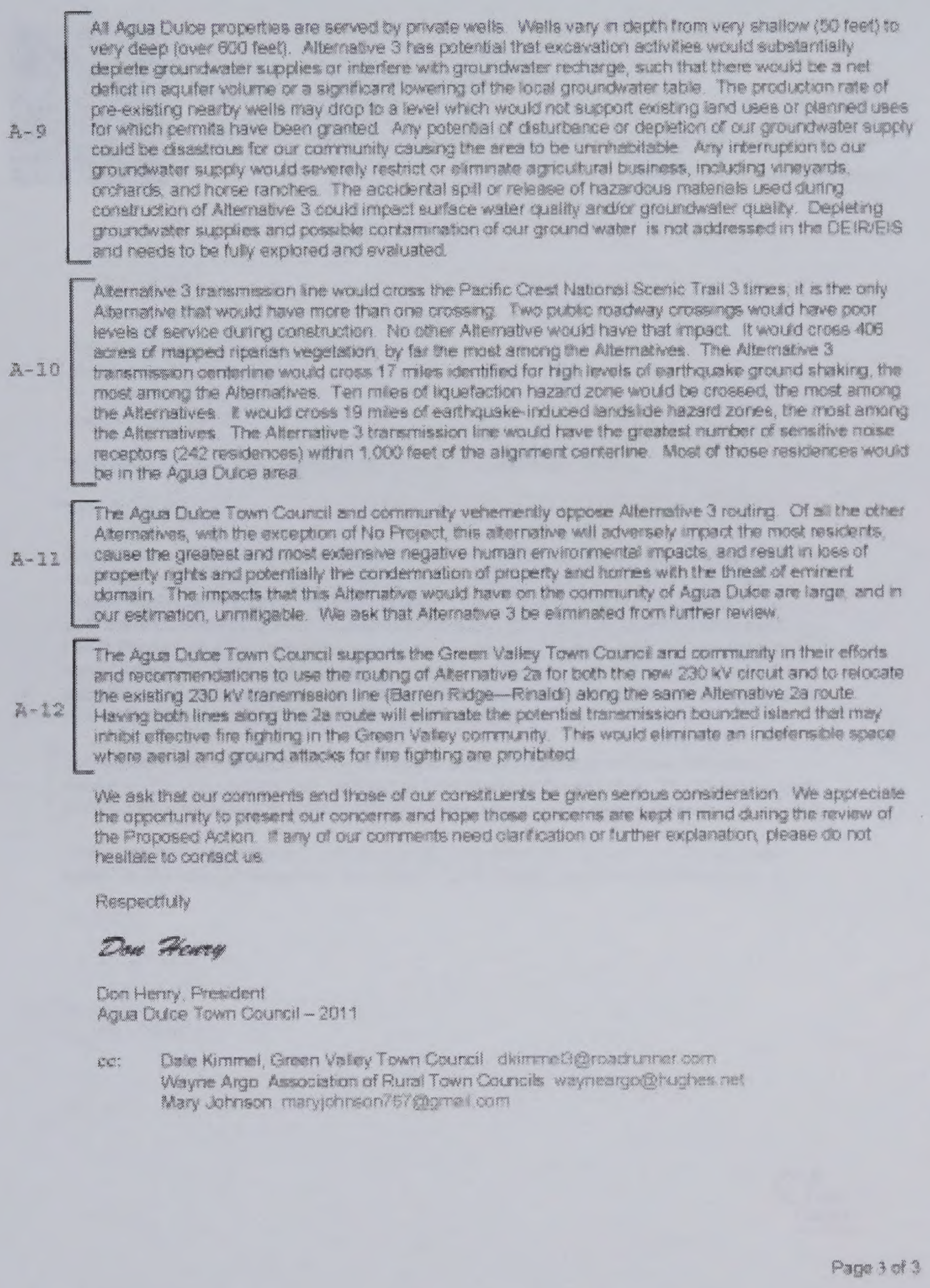
Response A-7: Please refer to Chapter 4, Section 4.2.13 of the Final EIS/EIR, Social and Economic Conditions, regarding effects on property values. Potential impacts to property values have been sufficiently analyzed and no further response is necessary. As described in Chapter 4, Section 4.2.12, of the Final EIS/EIR, because there is no consensus in the scientific community regarding health risks associated with electric and magnetic fields (EMF), conclusions cannot be reached on this subject in the Final EIS/EIR. Information regarding research on EMF associated with utility facilities is provided in Chapter 3, Section 3.2.12 of the Final EIS/EIR.

Response A-8: Your comments regarding Alternative 3 will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. Chapter 3, Section 3.2.11 of the Final EIS/EIR, Wildfire and Fuels, describes the existing conditions within the BRRTP fireshed. As discussed in Chapter 4, Section 4.2.11 of the Final EIS/EIR, Wildfire and Fuels, Alternative 3 construction and maintenance activities would pose an additional safety hazard for firefighters and reduce the effectiveness of firefighting. These potential impacts to wildfire and fuels have been sufficiently analyzed and disclosed.

General Practices have been incorporated into the Proposed Action to avoid or reduce impacts to local roads and emergency access and existing water sources (see Table 2-8 in Chapter 2 of the Final EIS/EIR). General Practice GP-2, Traffic Control Plan, requires measures to avoid disruptions or delays in access for emergency service vehicles and to keep emergency service agencies informed of any road closures, detours, or delays. GP-32 addresses repair and restoration of any damage caused to local roads by construction or maintenance activities. GP-28 would minimize traffic congestion and delays during construction by restricting closures to off-peak periods. GP-40 requires that existing water facilities be repaired or replaced if damaged or destroyed during construction activities.

Additionally, mitigation measures F-1a, F-1b, F-1d, F-1e, F-1f, and F-2a are recommended to reduce adverse impacts associated with the construction and maintenance activities of the transmission line, as well as the presence of the transmission line during operation. F-1a would remove, to the extent practicable, transmission line-bounded islands that would potentially prevent fire suppression activities. F-1b would remove the potential for wooden pole contact through proper engineering of the proposed transmission line. F-1d, F-1e, and F-2a would ensure proper planning and communication between Project-related construction and operation activities with firefighting activities. F-1f would ensure that proper FAA signage or lighting requirements would be met during final design of the transmission line. With the implementation of these mitigation measures, this impact would be reduced to a less than significant level.

Construction and/or maintenance activities would also increase the risk of a wildfire event where public safety is threatened. Mitigation measures F-1b, F-1c, F-1d, F-1e, F-2a, F-2b, F-2c, and F-3a are recommended to reduce adverse impacts associated with the increased risk of wildfire. F-1b would remove the potential for wooden pole contact through proper engineering of the proposed transmission line. F-1c, F-1d, F-1e, F-2a, and F-2b would ensure proper funding, planning, and communication between Project-related construction and operation activities with firefighting activities, including the maintenance of important firebreaks on the Angeles National Forest (ANF). F-2c would remove potential



A-9 All Agua Dulce properties are served by private wells. Wells vary in depth from very shallow (50 feet) to very deep (over 600 feet). Alternative 3 has potential that excavation activities would substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a significant lowering of the local groundwater table. The production rate of pre-existing nearby wells may drop to a level which would not support existing land uses or planned uses for which permits have been granted. Any potential of disturbance or depletion of our groundwater supply could be disastrous for our community causing the area to be uninhabitable. Any interruption to our groundwater supply would severely restrict or eliminate agricultural business, including vineyards, orchards, and horse ranches. The accidental spill or release of hazardous materials used during construction of Alternative 3 could impact surface water quality and/or groundwater quality. Depleting groundwater supplies and possible contamination of our ground water is not addressed in the DEIR/EIS and needs to be fully explored and evaluated.

A-10 Alternative 3 transmission line would cross the Pacific Crest National Scenic Trail 3 times; it is the only Alternative that would have more than one crossing. Two public roadway crossings would have poor levels of service during construction. No other Alternative would have that impact. It would cross 406 acres of mapped riparian vegetation, by far the most among the Alternatives. The Alternative 3 transmission centerline would cross 17 miles identified for high levels of earthquake ground shaking, the most among the Alternatives. Ten miles of liquefaction hazard zone would be crossed, the most among the Alternatives. It would cross 19 miles of earthquake-induced landslide hazard zones, the most among the Alternatives. The Alternative 3 transmission line would have the greatest number of sensitive noise receptors (242 residences) within 1,000 feet of the alignment centerline. Most of those residences would be in the Agua Dulce area.

A-11 The Agua Dulce Town Council and community vehemently oppose Alternative 3 routing. Of all the other Alternatives, with the exception of No Project, this alternative will adversely impact the most residents, cause the greatest and most extensive negative human environmental impacts, and result in loss of property rights and potentially the condemnation of property and homes with the threat of eminent domain. The impacts that this Alternative would have on the community of Agua Dulce are large, and in our estimation, unmitigable. We ask that Alternative 3 be eliminated from further review.

A-12 The Agua Dulce Town Council supports the Green Valley Town Council and community in their efforts and recommendations to use the routing of Alternative 2a for both the new 230 kV circuit and to relocate the existing 230 kV transmission line (Barren Ridge—Rinaldi) along the same Alternative 2a route. Having both lines along the 2a route will eliminate the potential transmission bounded island that may inhibit effective fire fighting in the Green Valley community. This would eliminate an indefensible space where aerial and ground attacks for fire fighting are prohibited.

We ask that our comments and those of our constituents be given serious consideration. We appreciate the opportunity to present our concerns and hope those concerns are kept in mind during the review of the Proposed Action. If any of our comments need clarification or further explanation, please do not hesitate to contact us.

Respectfully

Don Henry

Don Henry, President
Agua Dulce Town Council – 2011

cc: Dale Kimmel, Green Valley Town Council dkimmel3@roadrunner.com
Wayne Argo Association of Rural Town Councils wayneargo@hughes.net
Mary Johnson maryjohnson757@gmail.com

Page 3 of 3

hazards from work areas that could pose a fire hazard. F-3a identifies potential funding sources for fire prevention measures on private property. With the implementation of these mitigation measures, this impact would be reduced to a less than significant level.

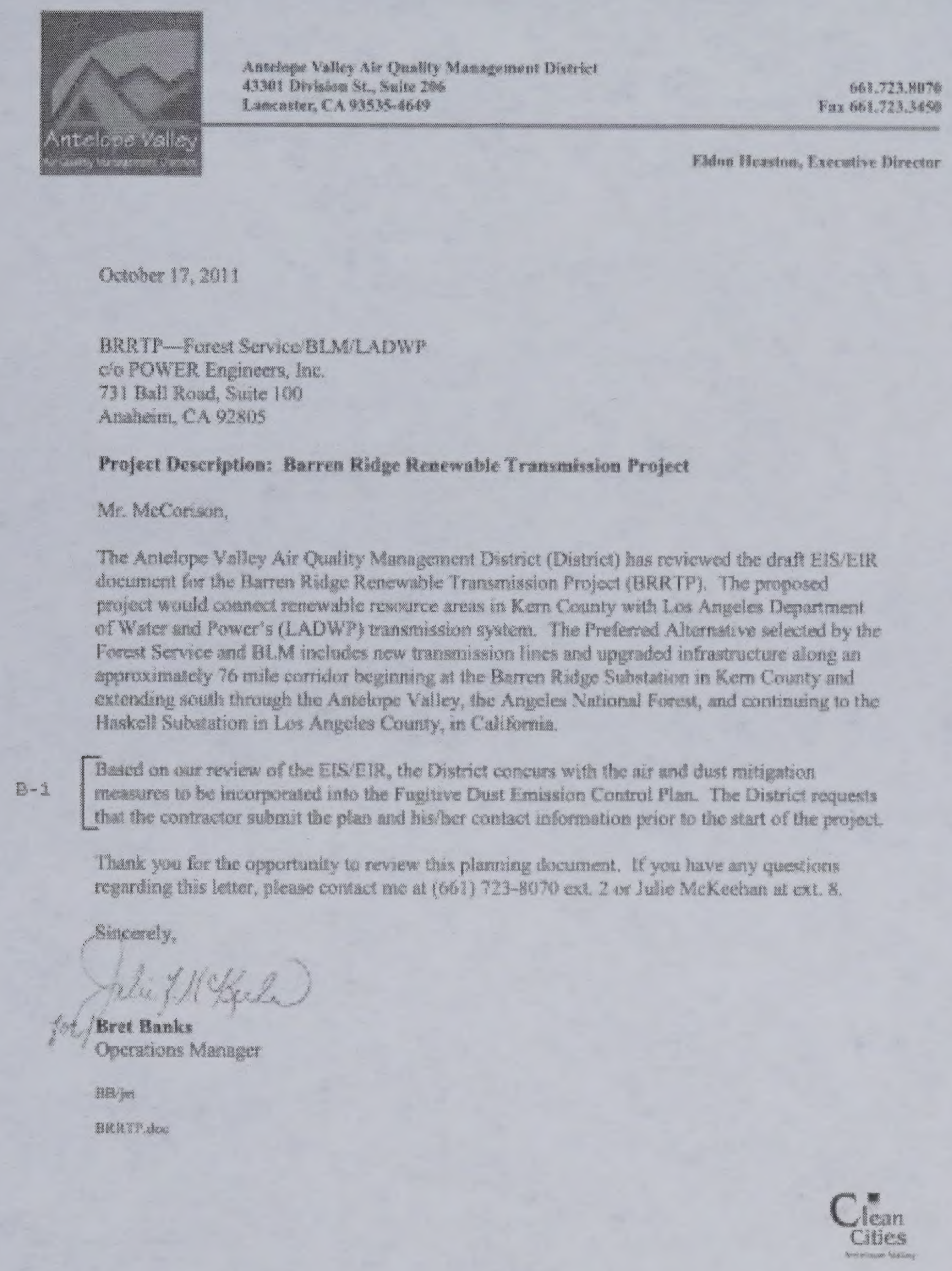
In addition, Project activities would introduce non-native plants, altering fire regimes by increasing ignition potential and rate of fire spread. Biological mitigation measure BIO-2 (see Chapter 4, Section 4.3.1, of the Final EIS/EIR) would reduce the adverse impacts of this impact to a less than significant level through the implementation of a weed management plan.

Response A-9: There are no Project activities that would intentionally withdraw groundwater for consumptive use under any of the Alternatives. Impacts to water quality, groundwater supply and recharge, and surface water for Alternative 3 are discussed in Chapter 4, Section 4.3.3, of the Final EIS/EIR, Water Resources. Impacts were determined to be less than significant.

Response A-10: This information is quoted from the Draft EIS/EIR and, as such, will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response A-11: NEPA and CEQA require the consideration of a reasonable range of Alternatives. As described in Chapter 2, Section 2.1.1, of the Final EIS/EIR, and on pages 61 through 66 of the Alternatives Development Report, included as Appendix B to the Final EIS/EIR, identified Alternatives were eliminated from detailed analysis in the EIS/EIR because they either did not meet the Project purpose and need/objectives or were determined to be infeasible. Because Alternative 3 would meet the Project purpose and need and was determined to be feasible, Alternative 3 was retained for detailed analysis in the Draft EIS/EIR. As described in Sections 2.7 and 2.8 of the Final EIS/EIR, Alternative 2 has been identified as the Federal Agency Preferred and Environmentally Superior Alternative. Alternative 3 is not the preferred Alternative due to the relatively greater magnitude of impacts associated with this Alternative. Your comments regarding Alternative 3 will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response A-12: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. NEPA and CEQA require the consideration of a reasonable range of Alternatives. Alternative 2, with the incorporation of Three-Circuit Tower Mitigation, as described in Chapter 2, Section 2.4.2 of the Final EIS/EIR, would not result in the formation of a transmission-line bounded island in the Green Valley area or any area. The Green Valley Town Council did not specifically recommend that the existing Barren Ridge-Rinaldi line be relocated to the Alternative 2a alignment. If the existing Barren-Ridge Rinaldi transmission line were relocated to the Alternative 2a alignment adjacent to the proposed 230 kV transmission line and the existing 500 kV DC line were to remain in place, a transmission-line bounded island would be created that would inhibit firefighting activities.



Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649

661.723.8070
Fax 661.723.3450

Eldon Heaston, Executive Director

October 17, 2011

BRRTP—Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Project Description: Barren Ridge Renewable Transmission Project

Mr. McCorison,

The Antelope Valley Air Quality Management District (District) has reviewed the draft EIS/EIR document for the Barren Ridge Renewable Transmission Project (BRRTP). The proposed project would connect renewable resource areas in Kern County with Los Angeles Department of Water and Power's (LADWP) transmission system. The Preferred Alternative selected by the Forest Service and BLM includes new transmission lines and upgraded infrastructure along an approximately 76 mile corridor beginning at the Barren Ridge Substation in Kern County and extending south through the Antelope Valley, the Angeles National Forest, and continuing to the Haskell Substation in Los Angeles County, in California.

B-1 Based on our review of the EIS/EIR, the District concurs with the air and dust mitigation measures to be incorporated into the Fugitive Dust Emission Control Plan. The District requests that the contractor submit the plan and his/her contact information prior to the start of the project.

Thank you for the opportunity to review this planning document. If you have any questions regarding this letter, please contact me at (661) 723-8070 ext. 2 or Julie McKeehan at ext. 8.

Sincerely,

for/ **Bret Banks**
Operations Manager

BB/jm

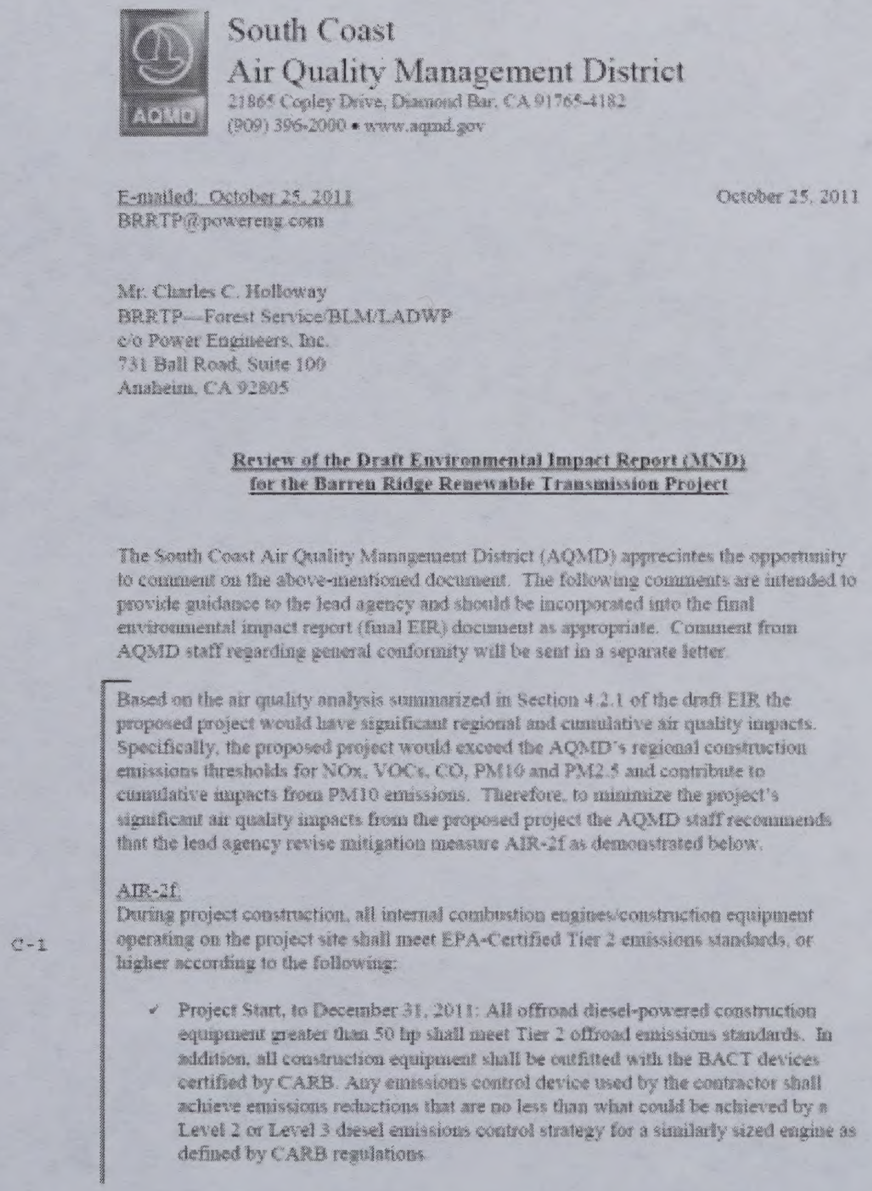
BRRTP.doc

Clean Cities

LETTER B: ANTELOPE VALLEY AQMD

Response B-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. Per the requirements of mitigation measure AIR-2a, LADWP's construction contractor will develop a Fugitive Dust Control Plan. The plan and contact information will be submitted to the Antelope Valley Air Quality Control District prior to start of the Project.

LETTER C: SOUTH COAST AQMD



South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

E-mailed: October 25, 2011
BRRTP@powereng.com

October 25, 2011

Mr. Charles C. Holloway
BRRTP—Forest Service/BLM/LADWP
c/o Power Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Review of the Draft Environmental Impact Report (MND)
for the Barren Ridge Renewable Transmission Project

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The following comments are intended to provide guidance to the lead agency and should be incorporated into the final environmental impact report (final EIR) document as appropriate. Comment from AQMD staff regarding general conformity will be sent in a separate letter.

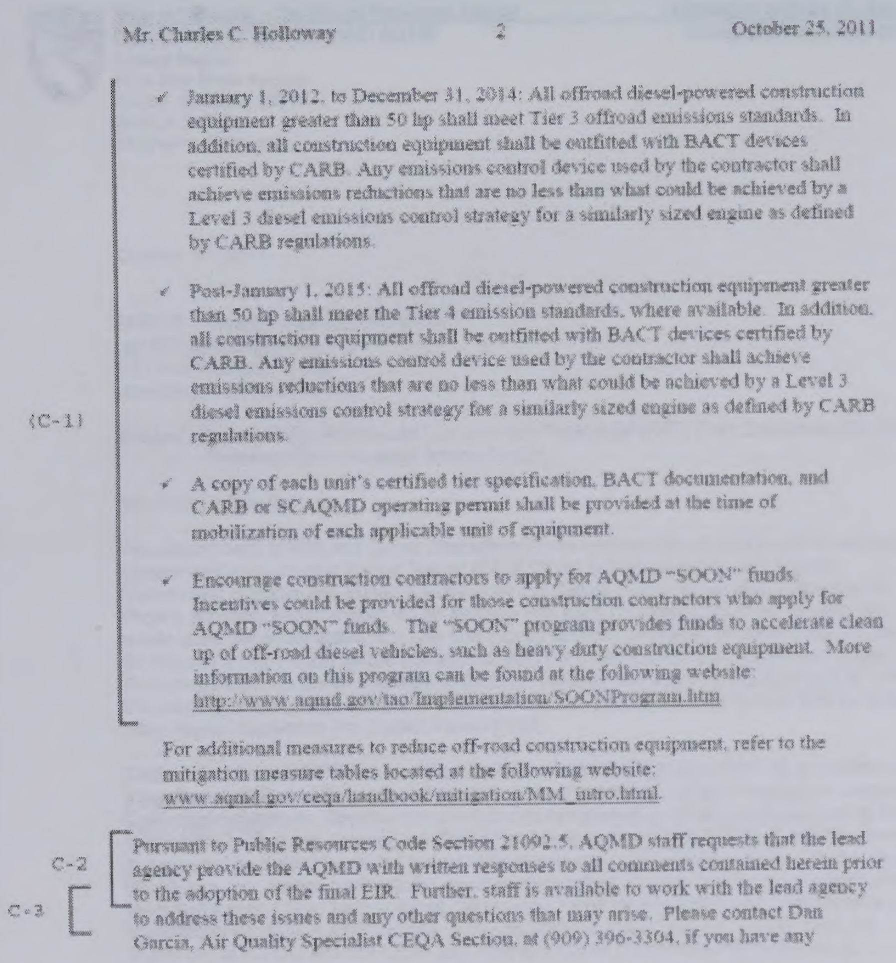
C-1

Based on the air quality analysis summarized in Section 4.2.1 of the draft EIR the proposed project would have significant regional and cumulative air quality impacts. Specifically, the proposed project would exceed the AQMD's regional construction emissions thresholds for NOx, VOCs, CO, PM10 and PM2.5 and contribute to cumulative impacts from PM10 emissions. Therefore, to minimize the project's significant air quality impacts from the proposed project the AQMD staff recommends that the lead agency revise mitigation measure AIR-2f as demonstrated below.

AIR-2f
During project construction, all internal combustion engines/construction equipment operating on the project site shall meet EPA-Certified Tier 2 emissions standards, or higher according to the following:

- ✓ Project Start, to December 31, 2011: All offroad diesel-powered construction equipment greater than 50 hp shall meet Tier 2 offroad emissions standards. In addition, all construction equipment shall be outfitted with the BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 2 or Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.

Response C-1: The revisions suggested by the South Coast Air Quality Management District (SCAQMD) to mitigation measure AIR-2f have been incorporated into the Final EIS/EIR on page 4-12.



Mr. Charles C. Holloway 2 October 25, 2011

- ✓ January 1, 2012, to December 31, 2014: All offroad diesel-powered construction equipment greater than 50 hp shall meet Tier 3 offroad emissions standards. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.
- ✓ Post-January 1, 2015: All offroad diesel-powered construction equipment greater than 50 hp shall meet the Tier 4 emission standards, where available. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. (C-1)
- ✓ A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment.
- ✓ Encourage construction contractors to apply for AQMD "SOON" funds. Incentives could be provided for those construction contractors who apply for AQMD "SOON" funds. The "SOON" program provides funds to accelerate clean up of off-road diesel vehicles, such as heavy duty construction equipment. More information on this program can be found at the following website: http://www.aqmd.gov/tao/Implementation/SOONProgram.htm

For additional measures to reduce off-road construction equipment, refer to the mitigation measure tables located at the following website: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html.

C-2 Pursuant to Public Resources Code Section 21092.5, AQMD staff requests that the lead agency provide the AQMD with written responses to all comments contained herein prior to the adoption of the final EIR. C-3 Further, staff is available to work with the lead agency to address these issues and any other questions that may arise. Please contact Dan Garcia, Air Quality Specialist CEQA Section, at (909) 396-3304, if you have any

Response C-2: Along with Responses C-1 above and C-3 below, this is the written response requested by SCAQMD.

Response C-3: It is acknowledged that SCAQMD is available to work with LADWP to address air quality issues recommended by the SCAQMD.

questions regarding the enclosed comments. For questions regarding general conformity, please contact Kathy Hsiao at (909) 396-3056

Sincerely,

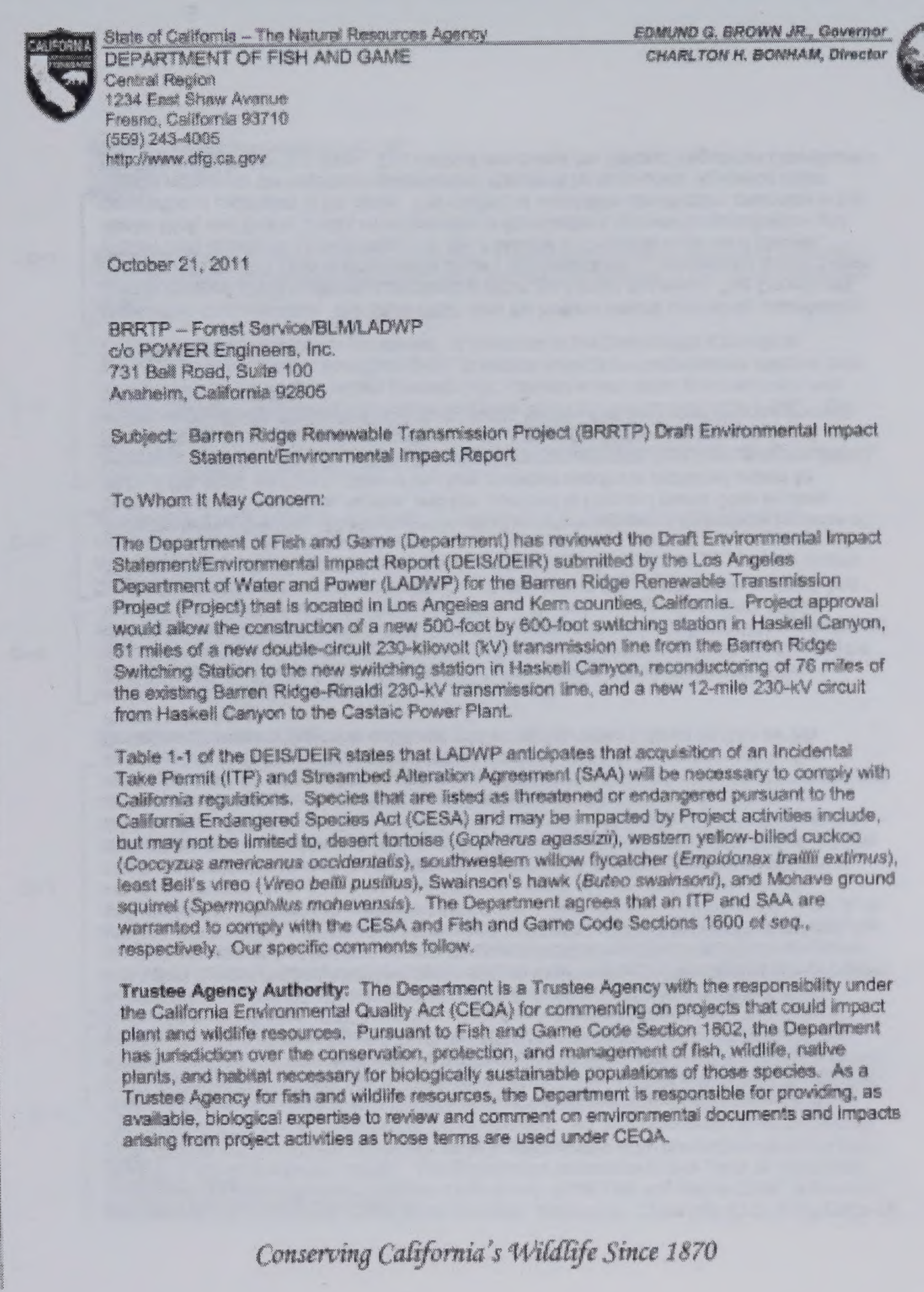
Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

Attachment

IM:DG

LAC110825-05
Control Number

LETTER D: CALIFORNIA DEPARTMENT OF FISH AND GAME



State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Central Region
1234 East Shaw Avenue
Fresno, California 93710
(559) 243-4005
http://www.dfg.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

October 21, 2011

BRRTP – Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Bell Road, Suite 100
Anaheim, California 92805

Subject: Barren Ridge Renewable Transmission Project (BRRTP) Draft Environmental Impact Statement/Environmental Impact Report

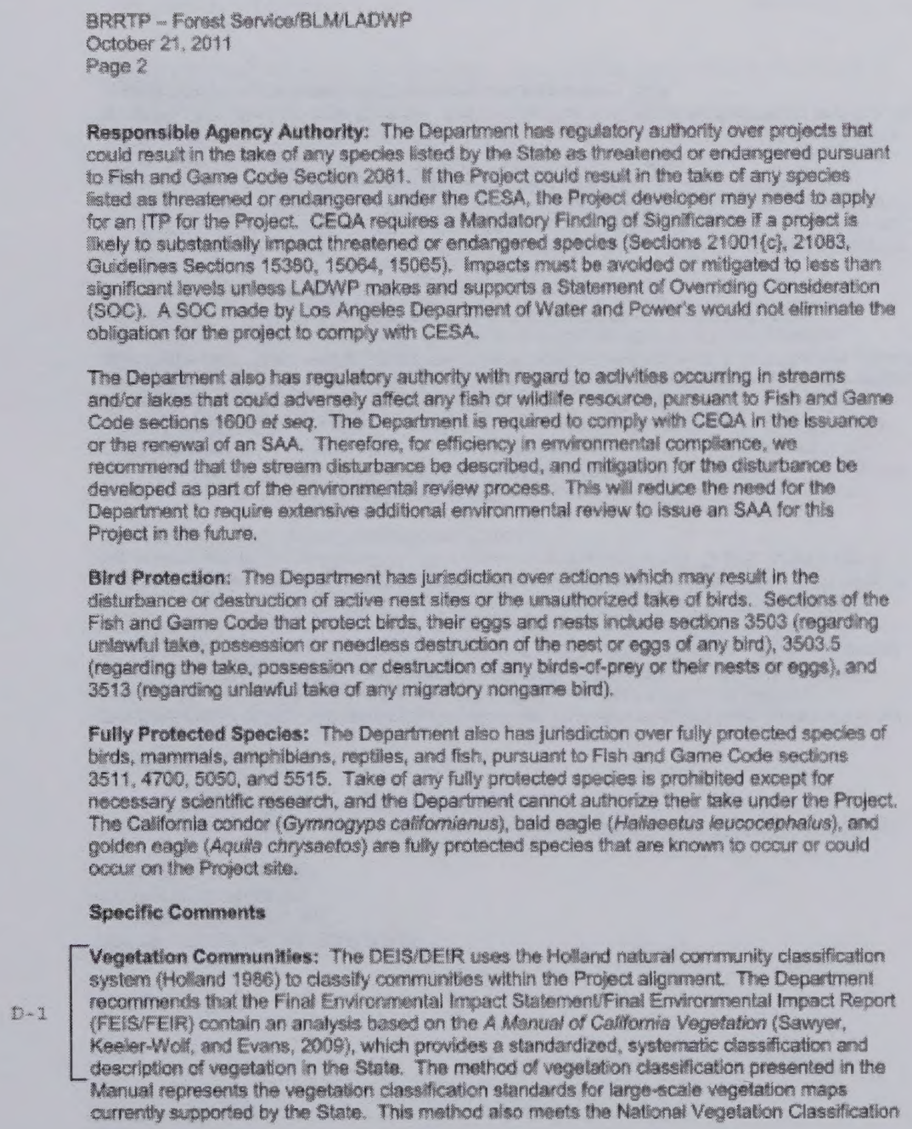
To Whom It May Concern:

The Department of Fish and Game (Department) has reviewed the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) submitted by the Los Angeles Department of Water and Power (LADWP) for the Barren Ridge Renewable Transmission Project (Project) that is located in Los Angeles and Kern counties, California. Project approval would allow the construction of a new 500-foot by 600-foot switching station in Haskell Canyon, 61 miles of a new double-circuit 230-kilovolt (kV) transmission line from the Barren Ridge Switching Station to the new switching station in Haskell Canyon, reconductoring of 76 miles of the existing Barren Ridge-Rinaldi 230-kV transmission line, and a new 12-mile 230-kV circuit from Haskell Canyon to the Castaic Power Plant.

Table 1-1 of the DEIS/DEIR states that LADWP anticipates that acquisition of an Incidental Take Permit (ITP) and Streambed Alteration Agreement (SAA) will be necessary to comply with California regulations. Species that are listed as threatened or endangered pursuant to the California Endangered Species Act (CESA) and may be impacted by Project activities include, but may not be limited to, desert tortoise (*Gopherus agassizii*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), Swainson's hawk (*Buteo swainsoni*), and Mohave ground squirrel (*Spermophilus mohavensis*). The Department agrees that an ITP and SAA are warranted to comply with the CESA and Fish and Game Code Sections 1600 *et seq.*, respectively. Our specific comments follow.

Trustee Agency Authority: The Department is a Trustee Agency with the responsibility under the California Environmental Quality Act (CEQA) for commenting on projects that could impact plant and wildlife resources. Pursuant to Fish and Game Code Section 1802, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. As a Trustee Agency for fish and wildlife resources, the Department is responsible for providing, as available, biological expertise to review and comment on environmental documents and impacts arising from project activities as those terms are used under CEQA.

Conserving California's Wildlife Since 1870



BRRTP – Forest Service/BLM/LADWP
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Responsible Agency Authority: The Department has regulatory authority over projects that could result in the take of any species listed by the State as threatened or endangered pursuant to Fish and Game Code Section 2081. If the Project could result in the take of any species listed as threatened or endangered under the CESA, the Project developer may need to apply for an ITP for the Project. CEQA requires a Mandatory Finding of Significance if a project is likely to substantially impact threatened or endangered species (Sections 21001(c), 21083, Guidelines Sections 15380, 15064, 15065). Impacts must be avoided or mitigated to less than significant levels unless LADWP makes and supports a Statement of Overriding Consideration (SOC). A SOC made by Los Angeles Department of Water and Power's would not eliminate the obligation for the project to comply with CESA.

The Department also has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource, pursuant to Fish and Game Code sections 1600 *et seq.* The Department is required to comply with CEQA in the issuance or the renewal of an SAA. Therefore, for efficiency in environmental compliance, we recommend that the stream disturbance be described, and mitigation for the disturbance be developed as part of the environmental review process. This will reduce the need for the Department to require extensive additional environmental review to issue an SAA for this Project in the future.

Bird Protection: The Department has jurisdiction over actions which may result in the disturbance or destruction of active nest sites or the unauthorized take of birds. Sections of the Fish and Game Code that protect birds, their eggs and nests include sections 3503 (regarding unlawful take, possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the take, possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful take of any migratory nongame bird).

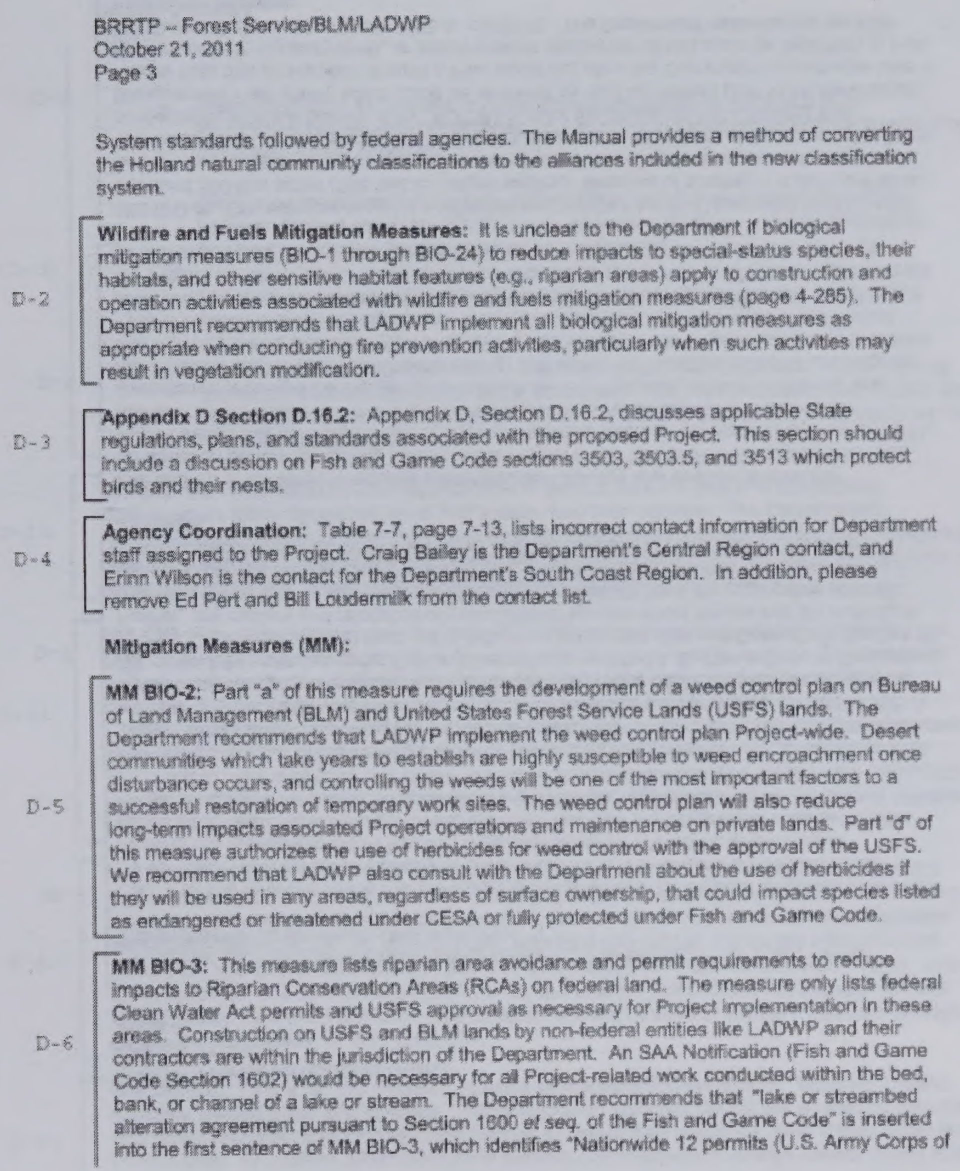
Fully Protected Species: The Department also has jurisdiction over fully protected species of birds, mammals, amphibians, reptiles, and fish, pursuant to Fish and Game Code sections 3511, 4700, 5050, and 5515. Take of any fully protected species is prohibited except for necessary scientific research, and the Department cannot authorize their take under the Project. The California condor (*Gymnogyps californianus*), bald eagle (*Haliaeetus leucocephalus*), and golden eagle (*Aquila chrysaetos*) are fully protected species that are known to occur or could occur on the Project site.

Specific Comments

D-1 **Vegetation Communities:** The DEIS/DEIR uses the Holland natural community classification system (Holland 1986) to classify communities within the Project alignment. The Department recommends that the Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) contain an analysis based on the *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, and Evans, 2009), which provides a standardized, systematic classification and description of vegetation in the State. The method of vegetation classification presented in the Manual represents the vegetation classification standards for large-scale vegetation maps currently supported by the State. This method also meets the National Vegetation Classification

Response D-1: The community descriptions are revised in Sections 3.3.1 and 4.3.1 in the Final EIS/EIR to incorporate the use of Sawyer, Keeler-Wolf and Evens 2009.

Because most vegetation community mapping occurred during 2008 and 2009 surveys, prior to the second edition of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, Evens November 2009), vegetation communities were described and mapped according to Holland (1986). When applicable, Sawyer, Keeler-Wolf (1995) equivalents were provided in the Biological Resources Technical Report included in Volume IV of the Final EIS/EIR. Vegetation mapping conducted in 2010 was described according to Holland (1986), with the Sawyer, Keeler-Wolf (1995) equivalent for consistency with earlier surveys. The Holland coding system (Holland 1986) was the accepted reference by both State and federal regulatory agencies prior to the second edition of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, Evens 2009) being published. However, as mentioned above, the community descriptions were revised to incorporate the use of Sawyer, Keeler-Wolf and Evens 2009.



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System standards followed by federal agencies. The Manual provides a method of converting the Holland natural community classifications to the alliances included in the new classification system.

D-2 **Wildfire and Fuels Mitigation Measures:** It is unclear to the Department if biological mitigation measures (BIO-1 through BIO-24) to reduce impacts to special-status species, their habitats, and other sensitive habitat features (e.g., riparian areas) apply to construction and operation activities associated with wildfire and fuels mitigation measures (page 4-285). The Department recommends that LADWP implement all biological mitigation measures as appropriate when conducting fire prevention activities, particularly when such activities may result in vegetation modification.

D-3 **Appendix D Section D.16.2:** Appendix D, Section D.16.2, discusses applicable State regulations, plans, and standards associated with the proposed Project. This section should include a discussion on Fish and Game Code sections 3503, 3503.5, and 3513 which protect birds and their nests.

D-4 **Agency Coordination:** Table 7-7, page 7-13, lists incorrect contact information for Department staff assigned to the Project. Craig Bailey is the Department's Central Region contact, and Erinn Wilson is the contact for the Department's South Coast Region. In addition, please remove Ed Pert and Bill Loudermilk from the contact list.

Mitigation Measures (MM):

D-5 **MM BIO-2:** Part "a" of this measure requires the development of a weed control plan on Bureau of Land Management (BLM) and United States Forest Service Lands (USFS) lands. The Department recommends that LADWP implement the weed control plan Project-wide. Desert communities which take years to establish are highly susceptible to weed encroachment once disturbance occurs, and controlling the weeds will be one of the most important factors to a successful restoration of temporary work sites. The weed control plan will also reduce long-term impacts associated Project operations and maintenance on private lands. Part "d" of this measure authorizes the use of herbicides for weed control with the approval of the USFS. We recommend that LADWP also consult with the Department about the use of herbicides if they will be used in any areas, regardless of surface ownership, that could impact species listed as endangered or threatened under CESA or fully protected under Fish and Game Code.

D-6 **MM BIO-3:** This measure lists riparian area avoidance and permit requirements to reduce impacts to Riparian Conservation Areas (RCAs) on federal land. The measure only lists federal Clean Water Act permits and USFS approval as necessary for Project implementation in these areas. Construction on USFS and BLM lands by non-federal entities like LADWP and their contractors are within the jurisdiction of the Department. An SAA Notification (Fish and Game Code Section 1602) would be necessary for all Project-related work conducted within the bed, bank, or channel of a lake or stream. The Department recommends that "lake or streambed alteration agreement pursuant to Section 1600 *et seq.* of the Fish and Game Code" is inserted into the first sentence of MM BIO-3, which identifies "Nationwide 12 permits (U.S. Army Corps of

Response D-2: All biological measures will be implemented as appropriate for Project activities, including fire prevention activities. Clarification that that activities associated with the implementation of the wildfire and fuels mitigation measures, including vegetation clearing, would require the implementation of all other appropriate Project mitigation measures, including biological resource mitigation measures, has been added to page 4-279 of the Final EIS/EIR.

Response D-3: A discussion of Fish and Game Code section 3503, 3503.5 and 3513 has been added to the Final EIS/EIR in Section D.16 of Appendix D, Regulatory Framework.

Response D-4: Table 7-7 on page 7-13 of the Final EIS/EIR has been updated to include Craig Bailey and Erinn Wilson. The following contacts have been removed from the contact list per your request: Ed Pert and Bill Loudermilk.

Response D-5: Per the requirements of mitigation measure BIO-2, a Project-wide weed control plan would be developed and implemented. Mitigation measure BIO-2 in the Final EIS/EIR (see Table 4.3.1-1 in Chapter 4 of the Final EIS/EIR) has been revised accordingly to note that, in areas where species listed as endangered or threatened under CESA or fully protected under Fish and Game Code could be present and impacted by herbicide use, LADWP will consult with the CDFG.

Response D-6: Streambed Alteration Agreement (SAA) Notification has been added to the permit requirements for Project implementation within the bed, bank, or channel of a lake or stream on page 1-22 of the Final EIS/EIR. Part "f" of mitigation measure BIO-3 has been amended to indicate that final mitigation within riparian conservation areas (RCAs) will be determined in consultation with the relevant permitting agencies (see pages 4-352

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Engineers) and RWQCB 301 water quality certification" as permits, which would require implementation by the construction managers.

(D-6) Part "f" of this measure states that the mitigation requirements for impacts to riparian areas will be consistent with the ratios included in Table BIO-MM-1. The Department recommends revising this measure to clarify that final mitigation within RCA's will be determined in consultation with the relevant permitting agencies, because the Department does not finalize mitigation obligations until a complete SAA notification package is received.

D-7 **MM BIO-5:** Part "a" of this measure requires preconstruction surveys in special-status species habitat, exclusion fencing if species are detected, and wildlife relocation if special-status species are later detected within the fence perimeter. The Department recommends the DEIS/DEIR state that this only applies to species that are not listed under CESA unless authorized by an ITP or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR). Capture (or attempt to do so) is defined as take under Fish and Game Code Section 86. Further, any capture and relocation of even unlisted species would require that the individuals engaging in any form of capture and relocation of any wildlife have the appropriate scientific collecting permits from the Department. The Department also considers exclusion fencing a form of capture (and thus take) if terrestrial wildlife species are present within the fence perimeter.

D-8 **MM BIO-7:** This measure requires preconstruction surveys and species specific no-construction buffers for nesting raptors in the Project area. The BRRTP Biological Technical Report states that Swainson's hawk (SWHA), a species listed as threatened pursuant to CESA, has been documented within 3 miles of the Project area. In addition to MM BIO-7, the Department recommends the Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California (California Energy Commission and Department 2010) to reduce Project impacts to less than significant. If SWHA is detected within 0.5 miles of the Project area, the Department recommends that LADWP consults with the Department to determine if the Project can avoid take. If take cannot be avoided, acquisition of an ITP under CESA would be warranted prior to Project implementation to avoid a violation of Fish and Game Code.

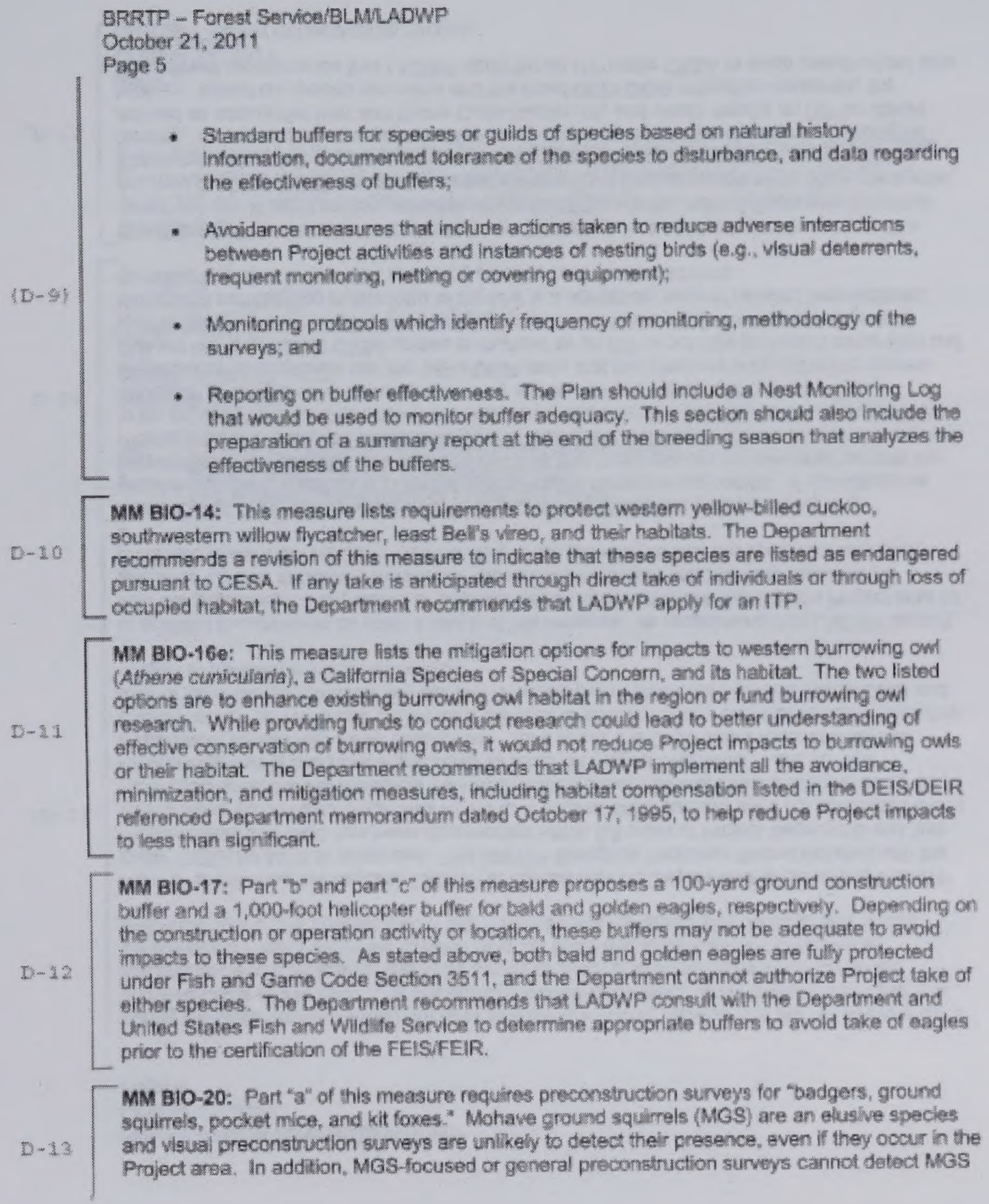
D-9 **MM BIO-8:** This measure requires notification and approval by the Department to reduce a standard 300-foot buffer (600 feet for golden eagles). Because of shortages in staff and other resources, the Department cannot review the effectiveness of buffers on a nest-by-nest basis. The Department recommends if LADWP anticipates regular reductions of the standard buffer to nest-specific effective buffers, then LADWP consider the preparation of a Nesting Bird Management Plan (Plan), which could be reviewed by the Department prior to implementation. Please note that preparation of such a Plan would not allow the Department to authorize take of birds-of-prey or migratory birds, or disturbance or destruction of bird nests as described in Fish and Game Code sections 3503, 3503.5, and 3513. The Department recommends the Plan include the following:

and 4-353 of the Final EIS/EIR). The lead agencies are committed to working closely with the permitting agencies to maximize consistency with CEQA and NEPA mitigation in these permitting processes.

Response D-7: The following text has been added to mitigation measure BIO-5a: "This only applies to species that are not listed under CESA [the California Endangered Species Act] unless authorized by an Incidental Take Permit or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR)." See page 4-353 of the Final EIS/EIR.

Response D-8: The Swainson's Hawk (SWHA) Survey Protocols will be implemented during the preconstruction surveys. The SWHA Survey Protocols have been added to mitigation measure BIO-7 in the Final EIS/EIR on page 4-354.

Response D-9: A Nesting Bird Management Plan will be developed and submitted to CDFG for review prior to Project implementation. The plan will outline guidelines for nest-specific effective buffers and will include the recommendations listed.



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(D-9)

- Standard buffers for species or guilds of species based on natural history information, documented tolerance of the species to disturbance, and data regarding the effectiveness of buffers;
- Avoidance measures that include actions taken to reduce adverse interactions between Project activities and instances of nesting birds (e.g., visual deterrents, frequent monitoring, netting or covering equipment);
- Monitoring protocols which identify frequency of monitoring, methodology of the surveys; and
- Reporting on buffer effectiveness. The Plan should include a Nest Monitoring Log that would be used to monitor buffer adequacy. This section should also include the preparation of a summary report at the end of the breeding season that analyzes the effectiveness of the buffers.

D-10 **MM BIO-14:** This measure lists requirements to protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitats. The Department recommends a revision of this measure to indicate that these species are listed as endangered pursuant to CESA. If any take is anticipated through direct take of individuals or through loss of occupied habitat, the Department recommends that LADWP apply for an ITP.

D-11 **MM BIO-16e:** This measure lists the mitigation options for impacts to western burrowing owl (*Athene cunicularia*), a California Species of Special Concern, and its habitat. The two listed options are to enhance existing burrowing owl habitat in the region or fund burrowing owl research. While providing funds to conduct research could lead to better understanding of effective conservation of burrowing owls, it would not reduce Project impacts to burrowing owls or their habitat. The Department recommends that LADWP implement all the avoidance, minimization, and mitigation measures, including habitat compensation listed in the DEIS/DEIR referenced Department memorandum dated October 17, 1995, to help reduce Project impacts to less than significant.

D-12 **MM BIO-17:** Part "b" and part "c" of this measure proposes a 100-yard ground construction buffer and a 1,000-foot helicopter buffer for bald and golden eagles, respectively. Depending on the construction or operation activity or location, these buffers may not be adequate to avoid impacts to these species. As stated above, both bald and golden eagles are fully protected under Fish and Game Code Section 3511, and the Department cannot authorize Project take of either species. The Department recommends that LADWP consult with the Department and United States Fish and Wildlife Service to determine appropriate buffers to avoid take of eagles prior to the certification of the FEIS/FEIR.

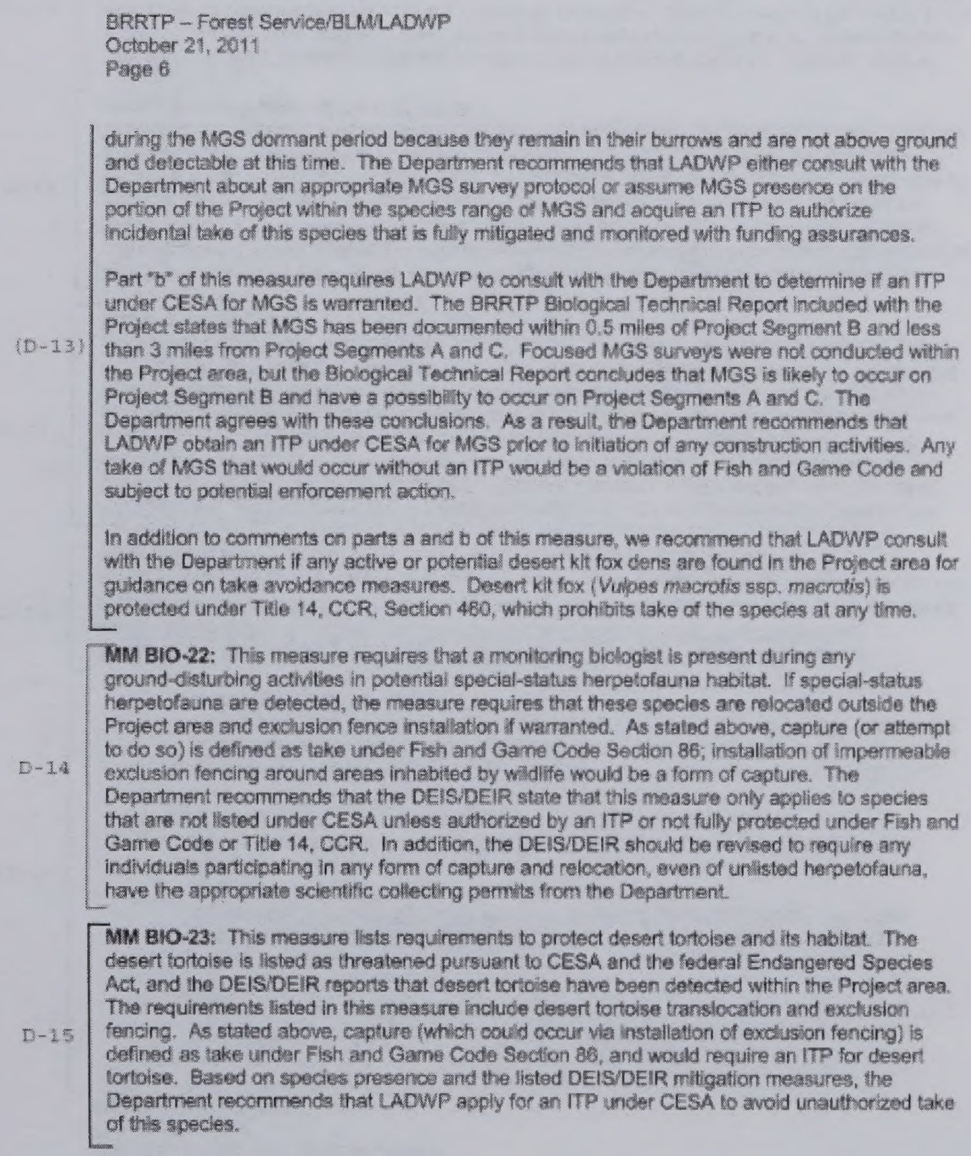
D-13 **MM BIO-20:** Part "a" of this measure requires preconstruction surveys for "badgers, ground squirrels, pocket mice, and kit foxes." Mohave ground squirrels (MGS) are an elusive species and visual preconstruction surveys are unlikely to detect their presence, even if they occur in the Project area. In addition, MGS-focused or general preconstruction surveys cannot detect MGS

Response D-10: The text has been revised on page 4-357 of the Final EIS/EIR to list these species as endangered pursuant to CESA.

Response D-11: Mitigation measure BIO-16 has been revised in the Final EIS/EIR on page 4-358 to remove funding of burrowing owl research as potential mitigation, since this would not reduce Project impacts as outlined in this comment by the California Department of Fish and Game (CDFG). As outlined and recommended by the CDFG, mitigation measure BIO-16 would avoid and minimize the potential for take of burrowing owl nests associated with the proposed Project. This measure includes conducting preconstruction surveys, avoiding the breeding season, and providing a buffer around occupied burrows.

Response D-12: USFS and BLM are consulting with the U.S. Fish and Wildlife Service (USFWS) to determine appropriate buffers to avoid take of eagles prior to certification of the Final EIS/EIR. In addition, USFS, BLM, and LADWP will consult with the CDFG to determine appropriate buffers. Both consultations will occur prior to certification of the Final EIS/EIR.

Response D-13: LADWP will continue to consult with the CDFG regarding the Mohave Ground Squirrel. It is assumed that an Incidental Take Permit will be developed for the Mohave Ground Squirrel.



BRRTP – Forest Service/BLM/LADWP
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(D-13) during the MGS dormant period because they remain in their burrows and are not above ground and detectable at this time. The Department recommends that LADWP either consult with the Department about an appropriate MGS survey protocol or assume MGS presence on the portion of the Project within the species range of MGS and acquire an ITP to authorize incidental take of this species that is fully mitigated and monitored with funding assurances.

Part "b" of this measure requires LADWP to consult with the Department to determine if an ITP under CESA for MGS is warranted. The BRRTP Biological Technical Report included with the Project states that MGS has been documented within 0.5 miles of Project Segment B and less than 3 miles from Project Segments A and C. Focused MGS surveys were not conducted within the Project area, but the Biological Technical Report concludes that MGS is likely to occur on Project Segment B and have a possibility to occur on Project Segments A and C. The Department agrees with these conclusions. As a result, the Department recommends that LADWP obtain an ITP under CESA for MGS prior to initiation of any construction activities. Any take of MGS that would occur without an ITP would be a violation of Fish and Game Code and subject to potential enforcement action.

In addition to comments on parts a and b of this measure, we recommend that LADWP consult with the Department if any active or potential desert kit fox dens are found in the Project area for guidance on take avoidance measures. Desert kit fox (*Vulpes macrotis* ssp. *macrotis*) is protected under Title 14, CCR, Section 460, which prohibits take of the species at any time.

D-14 **MM BIO-22:** This measure requires that a monitoring biologist is present during any ground-disturbing activities in potential special-status herpetofauna habitat. If special-status herpetofauna are detected, the measure requires that these species are relocated outside the Project area and exclusion fence installation if warranted. As stated above, capture (or attempt to do so) is defined as take under Fish and Game Code Section 86; installation of impermeable exclusion fencing around areas inhabited by wildlife would be a form of capture. The Department recommends that the DEIS/DEIR state that this measure only applies to species that are not listed under CESA unless authorized by an ITP or not fully protected under Fish and Game Code or Title 14, CCR. In addition, the DEIS/DEIR should be revised to require any individuals participating in any form of capture and relocation, even of unlisted herpetofauna, have the appropriate scientific collecting permits from the Department.

D-15 **MM BIO-23:** This measure lists requirements to protect desert tortoise and its habitat. The desert tortoise is listed as threatened pursuant to CESA and the federal Endangered Species Act, and the DEIS/DEIR reports that desert tortoise have been detected within the Project area. The requirements listed in this measure include desert tortoise translocation and exclusion fencing. As stated above, capture (which could occur via installation of exclusion fencing) is defined as take under Fish and Game Code Section 86, and would require an ITP for desert tortoise. Based on species presence and the listed DEIS/DEIR mitigation measures, the Department recommends that LADWP apply for an ITP under CESA to avoid unauthorized take of this species.

Response D-14: Although preconstruction surveys will be conducted and any detected special-status herpetofauna would be removed from construction areas, the possibility remains that use of exclusion fencing within designated construction zones could trap or capture animals that are not detected prior to fence installation or construction. This would be considered take under Section 86 of the Fish and Game Code. Therefore, mitigation measure BIO-22 has been revised on page 4-360 of the Final EIS/EIR to state that exclusion fencing will only be used in instances of special-status herpetofauna that are not protected by the CESA—unless specifically authorized by an Incidental Take Permit—or are not considered Fully Protected under Fish and Game Code or Title 14 of the California Code of Regulations. The only CESA-listed herpetofauna that is expected to have the possibility of occurring within the BRRTP area is the desert tortoise. LADWP would apply for an Incidental Take Permit to avoid unauthorized take of desert tortoise by installation of an exclusion fence. The Final EIS/EIR was also revised in Chapter 4 on page 4-4-361 to include that non-federal biologists will have the appropriate CDFG scientific collection permit.

Response D-15: Although preconstruction surveys will be conducted, and detected desert tortoises removed from construction areas, the possibility remains that use of exclusion fencing within designated construction zones could trap or capture desert tortoises not located prior to fence installation. Because this would be considered take under Section 86 of the Fish and Game Code, LADWP would apply for an Incidental Take Permit to avoid unauthorized take of the desert tortoise incidentally in this manner.

If you have any questions regarding these comments, please contact Craig Bailey, Staff Environmental Scientist, at the address provided on this letterhead or by telephone at (559) 243-4014, extension 261, or Erinn Wilson, Staff Environmental Scientist at (714) 968-0953.

Sincerely,

JOHN BAKER (FOR)

Jeffrey R. Single, Ph.D.
Regional Manager

ec: Charles C. Holloway (charles.holloway@ladwp.com)
Nadia Parker (Nadia.Parker@ladwp.com)
Los Angeles Department of Water and Power

Literature Cited

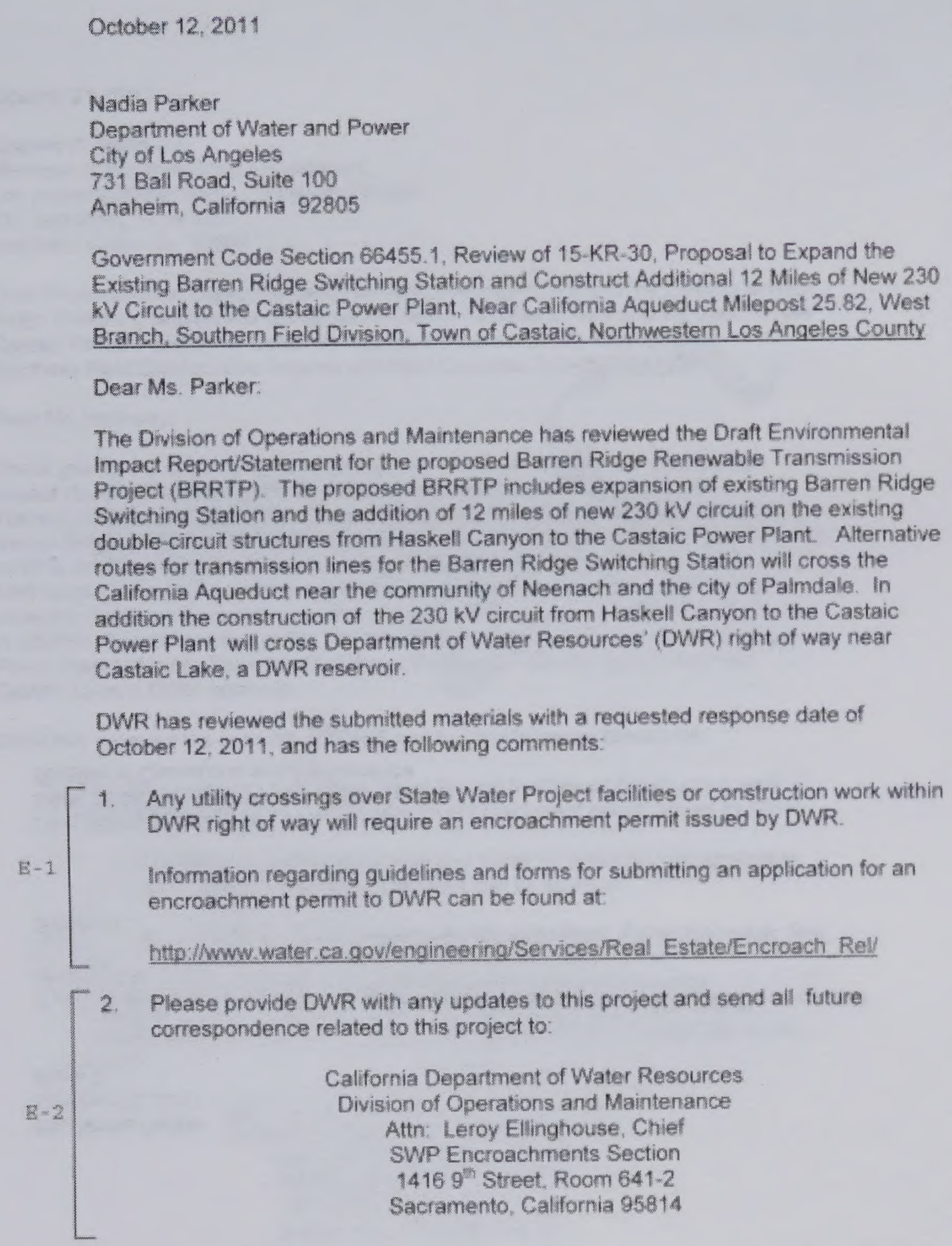
California Energy Commission and California Department of Fish and Game. 2010. Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California. State of California, California Energy Commission and Department of Fish and Game, June 2, 2010.

California Department of Fish and Game. 1995. Staff Report on Burrowing Owl Mitigation. California Department of Fish and Game.

Holland, R. 1986. Preliminary list of terrestrial natural communities of California. Department of Fish and Game, Sacramento, CA.

Sawyer, J. O. T. Keeler-Wolf, and J. Evans. 2009. A Manual of California Vegetation. California Native Plant Society.

LETTER E: CALIFORNIA DEPARTMENT OF WATER RESOURCES



October 12, 2011

Nadia Parker
Department of Water and Power
City of Los Angeles
731 Ball Road, Suite 100
Anaheim, California 92805

Government Code Section 66455.1, Review of 15-KR-30, Proposal to Expand the Existing Barren Ridge Switching Station and Construct Additional 12 Miles of New 230 kV Circuit to the Castaic Power Plant, Near California Aqueduct Milepost 25.82, West Branch, Southern Field Division, Town of Castaic, Northwestern Los Angeles County

Dear Ms. Parker:

The Division of Operations and Maintenance has reviewed the Draft Environmental Impact Report/Statement for the proposed Barren Ridge Renewable Transmission Project (BRRTP). The proposed BRRTP includes expansion of existing Barren Ridge Switching Station and the addition of 12 miles of new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant. Alternative routes for transmission lines for the Barren Ridge Switching Station will cross the California Aqueduct near the community of Neenach and the city of Palmdale. In addition the construction of the 230 kV circuit from Haskell Canyon to the Castaic Power Plant will cross Department of Water Resources' (DWR) right of way near Castaic Lake, a DWR reservoir.

DWR has reviewed the submitted materials with a requested response date of October 12, 2011, and has the following comments:

E-1

1. Any utility crossings over State Water Project facilities or construction work within DWR right of way will require an encroachment permit issued by DWR.

   Information regarding guidelines and forms for submitting an application for an encroachment permit to DWR can be found at:

   http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

E-2

2. Please provide DWR with any updates to this project and send all future correspondence related to this project to:

California Department of Water Resources
Division of Operations and Maintenance
Attn: Leroy Ellinghouse, Chief
SWP Encroachments Section
1416 9th Street, Room 641-2
Sacramento, California 95814

Response E-1: The Department of Water Resources (DWR) requirements for an encroachment permits have been added to the permit requirements for Project implementation in Table 1-1 in Chapter 1 of the Final EIS/EIR. .

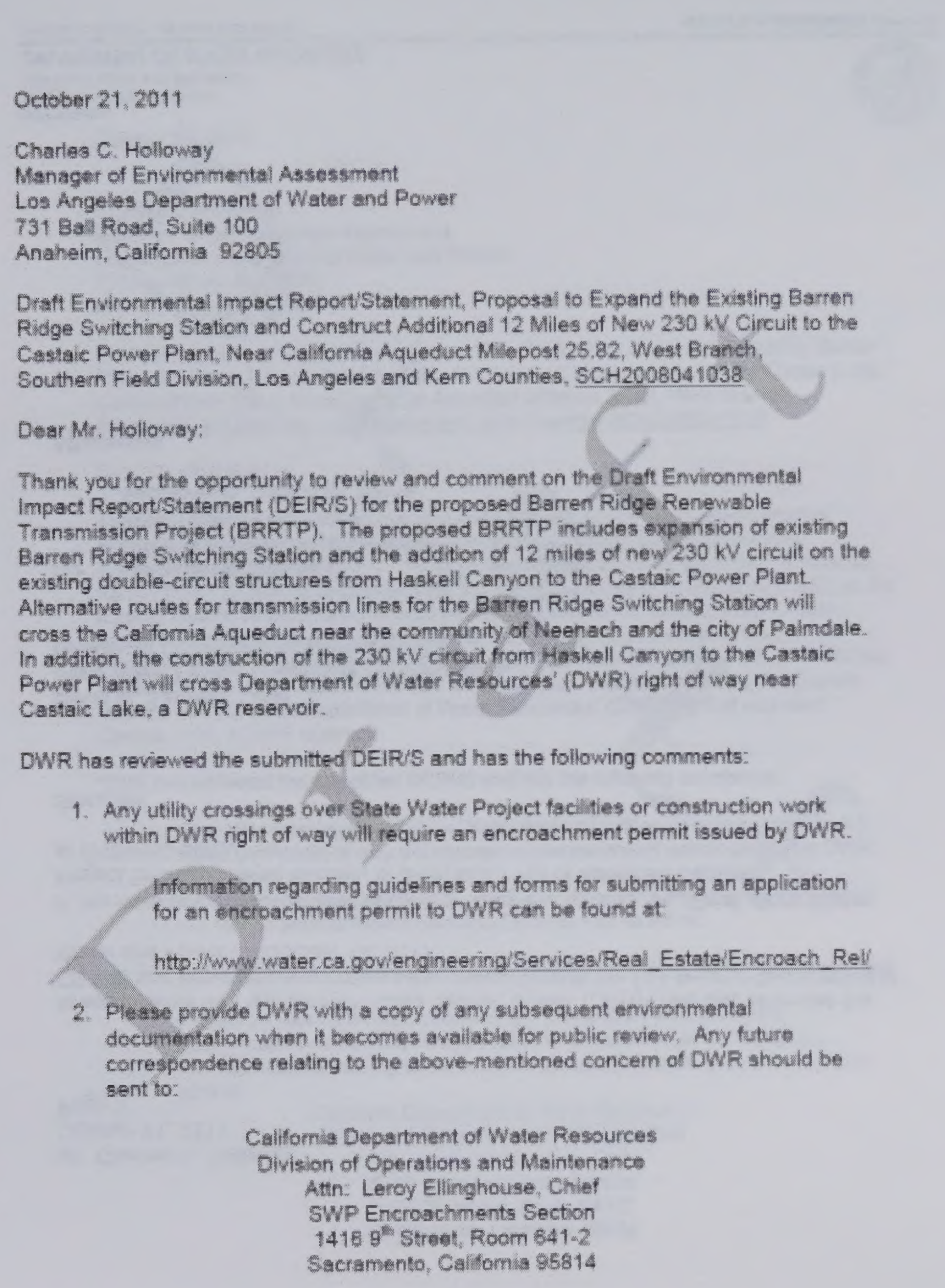
Response E-2: DWR will be provided Project updates at the address listed.

Ms. Nadia Parker
October 12, 2011
Page 2

If you have any questions about this letter, please contact Jonathan Canuela of my staff at (916) 653-5095.

Sincerely,

Leroy Ellinghouse, Chief
State Water Project Encroachments Section
Division of Operations and Maintenance



October 21, 2011

Charles C. Holloway
Manager of Environmental Assessment
Los Angeles Department of Water and Power
731 Ball Road, Suite 100
Anaheim, California 92805

Draft Environmental Impact Report/Statement, Proposal to Expand the Existing Barren Ridge Switching Station and Construct Additional 12 Miles of New 230 kV Circuit to the Castaic Power Plant, Near California Aqueduct Milepost 25.82, West Branch, Southern Field Division, Los Angeles and Kern Counties, SCH2008041038

Dear Mr. Holloway:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report/Statement (DEIR/S) for the proposed Barren Ridge Renewable Transmission Project (BRRTP). The proposed BRRTP includes expansion of existing Barren Ridge Switching Station and the addition of 12 miles of new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant. Alternative routes for transmission lines for the Barren Ridge Switching Station will cross the California Aqueduct near the community of Neenach and the city of Palmdale. In addition, the construction of the 230 kV circuit from Haskell Canyon to the Castaic Power Plant will cross Department of Water Resources' (DWR) right of way near Castaic Lake, a DWR reservoir.

DWR has reviewed the submitted DEIR/S and has the following comments:

1. Any utility crossings over State Water Project facilities or construction work within DWR right of way will require an encroachment permit issued by DWR.

   Information regarding guidelines and forms for submitting an application for an encroachment permit to DWR can be found at:

   http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

2. Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to the above-mentioned concern of DWR should be sent to:

   California Department of Water Resources
   Division of Operations and Maintenance
   Attn: Leroy Ellinghouse, Chief
   SWP Encroachments Section
   1416 9th Street, Room 641-2
   Sacramento, California 95814

Draft

LETTER F: CALIFORNIA DEPARTMENT OF WATER RESOURCES

Response F: Please refer to the responses to Letter E.

In accordance with Government Code Section 66455.1, DWR has also reviewed the DEIR/S and provided comments on a separate letter to the Los Angeles Department of Water and Power on October 12, 2011.

If you have any questions, please contact Leroy Ellinghouse, Jr., Chief, State Water Project Encroachments Section, at (916) 653-7168 or Jonathan Canuela at (916) 653-5095.

Sincerely,

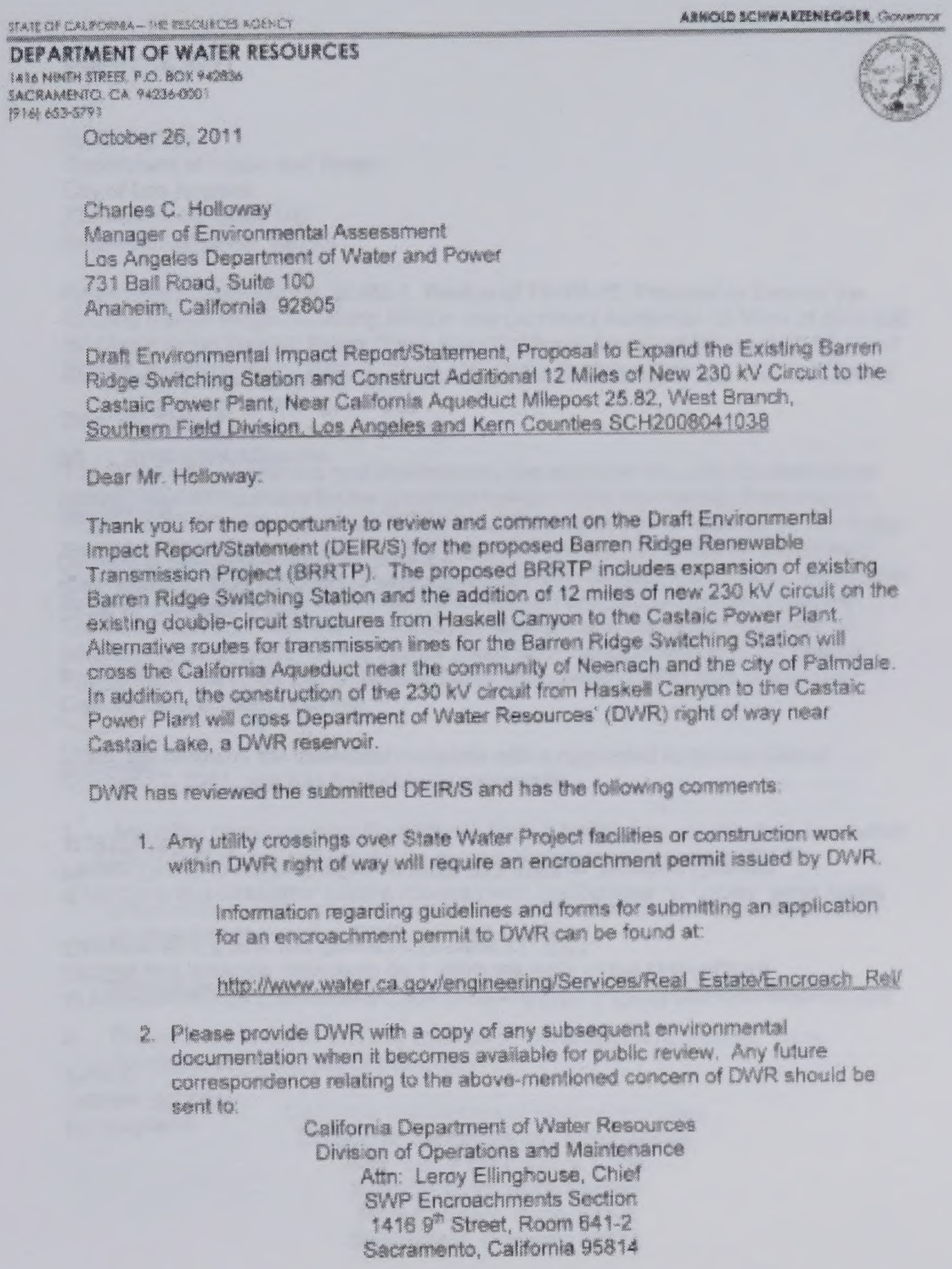
David M. Samson, Chief
State Water Project Operations Support Office
Division of Operations and Maintenance

cc: State Clearinghouse
Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, California 95814

Attachment

Draft

LETTER F(2): CALIFORNIA DEPARTMENT OF WATER RESOURCES



STATE OF CALIFORNIA – THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 26, 2011

Charles C. Holloway
Manager of Environmental Assessment
Los Angeles Department of Water and Power
731 Ball Road, Suite 100
Anaheim, California 92805

Draft Environmental Impact Report/Statement, Proposal to Expand the Existing Barren Ridge Switching Station and Construct Additional 12 Miles of New 230 kV Circuit to the Castaic Power Plant, Near California Aqueduct Milepost 25.82, West Branch, Southern Field Division, Los Angeles and Kern Counties SCH2008041038

Dear Mr. Holloway:

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DWR has reviewed the submitted DEIR/S and has the following comments:

1. Any utility crossings over State Water Project facilities or construction work within DWR right of way will require an encroachment permit issued by DWR.

   Information regarding guidelines and forms for submitting an application for an encroachment permit to DWR can be found at:

   http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

2. Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to the above-mentioned concern of DWR should be sent to:

California Department of Water Resources
Division of Operations and Maintenance
Attn: Leroy Ellinghouse, Chief
SWP Encroachments Section
1416 9th Street, Room 641-2
Sacramento, California 95814

Response F(2): Please refer to the responses to Letter E.

Mr. Holloway
October 26, 2011
Page 2

In accordance with Government Code Section 66455.1, DWR has also reviewed the DEIR/S and provided comments on a separate letter to the Los Angeles Department of Water and Power on October 12, 2011.

If you have any questions, please contact Leroy Ellinghouse, Jr., Chief, State Water Project Encroachments Section, at (916) 653-7168 or Jonathan Canuela at (916) 653-5095.

Sincerely,

David M Samson

David M. Samson, Chief
State Water Project Operations Support Office
Division of Operations and Maintenance

Attachment

cc: State Clearinghouse
Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, California 95814

October 12, 2011

Nadia Parker
Department of Water and Power
City of Los Angeles
731 Ball Road, Suite 100
Anaheim, California 92805

Government Code Section 66455.1, Review of 15-KR-30, Proposal to Expand the Existing Barren Ridge Switching Station and Construct Additional 12 Miles of New 230 kV Circuit to the Castaic Power Plant, Near California Aqueduct Milepost 25.82, West Branch, Southern Field Division, Town of Castaic, Northwestern Los Angeles County

Dear Ms. Parker:

The Division of Operations and Maintenance has reviewed the Draft Environmental Impact Report/Statement for the proposed Barren Ridge Renewable Transmission Project (BRRTP). The proposed BRRTP includes expansion of existing Barren Ridge Switching Station and the addition of 12 miles of new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant. Alternative routes for transmission lines for the Barren Ridge Switching Station will cross the California Aqueduct near the community of Neenach and the city of Palmdale. In addition the construction of the 230 kV circuit from Haskell Canyon to the Castaic Power Plant will cross Department of Water Resources' (DWR) right of way near Castaic Lake, a DWR reservoir.

DWR has reviewed the submitted materials with a requested response date of October 12, 2011, and has the following comments:

1. Any utility crossings over State Water Project facilities or construction work within DWR right of way will require an encroachment permit issued by DWR.

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   http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

2. Please provide DWR with any updates to this project and send all future correspondence related to this project to:

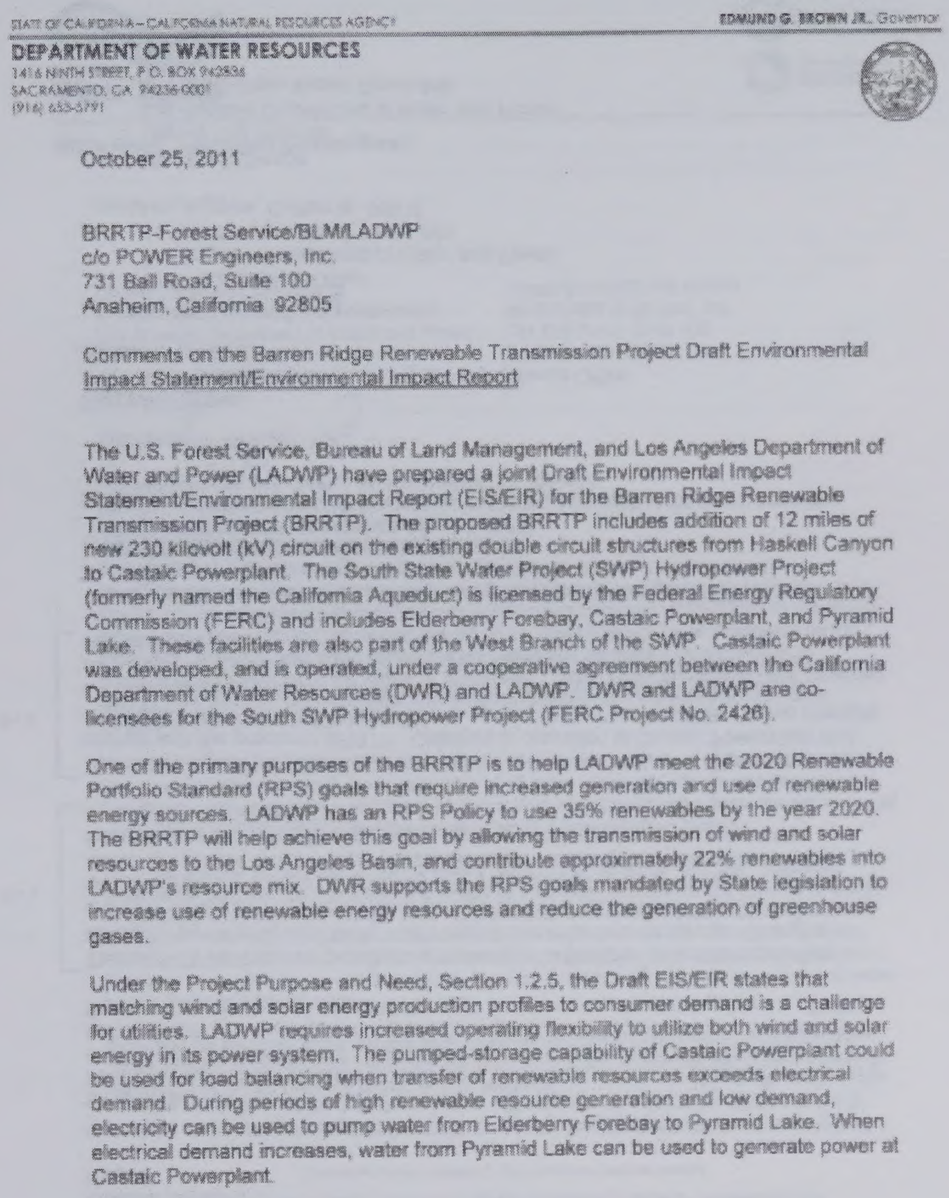
   California Department of Water Resources
   Division of Operations and Maintenance
   Attn: Leroy Ellinghouse, Chief
   SWP Encroachments Section
   1416 9th Street, Room 641-2
   Sacramento, California 95814

If you have any questions about this letter, please contact Jonathan Canuela of my staff at (916) 653-5095.

Sincerely,

Leroy Ellinghouse, Chief
State Water Project Encroachments Section
Division of Operations and Maintenance

LETTER G: CALIFORNIA DEPARTMENT OF WATER RESOURCES



STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY
EDMUND G. BROWN JR., Governor
DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 25, 2011

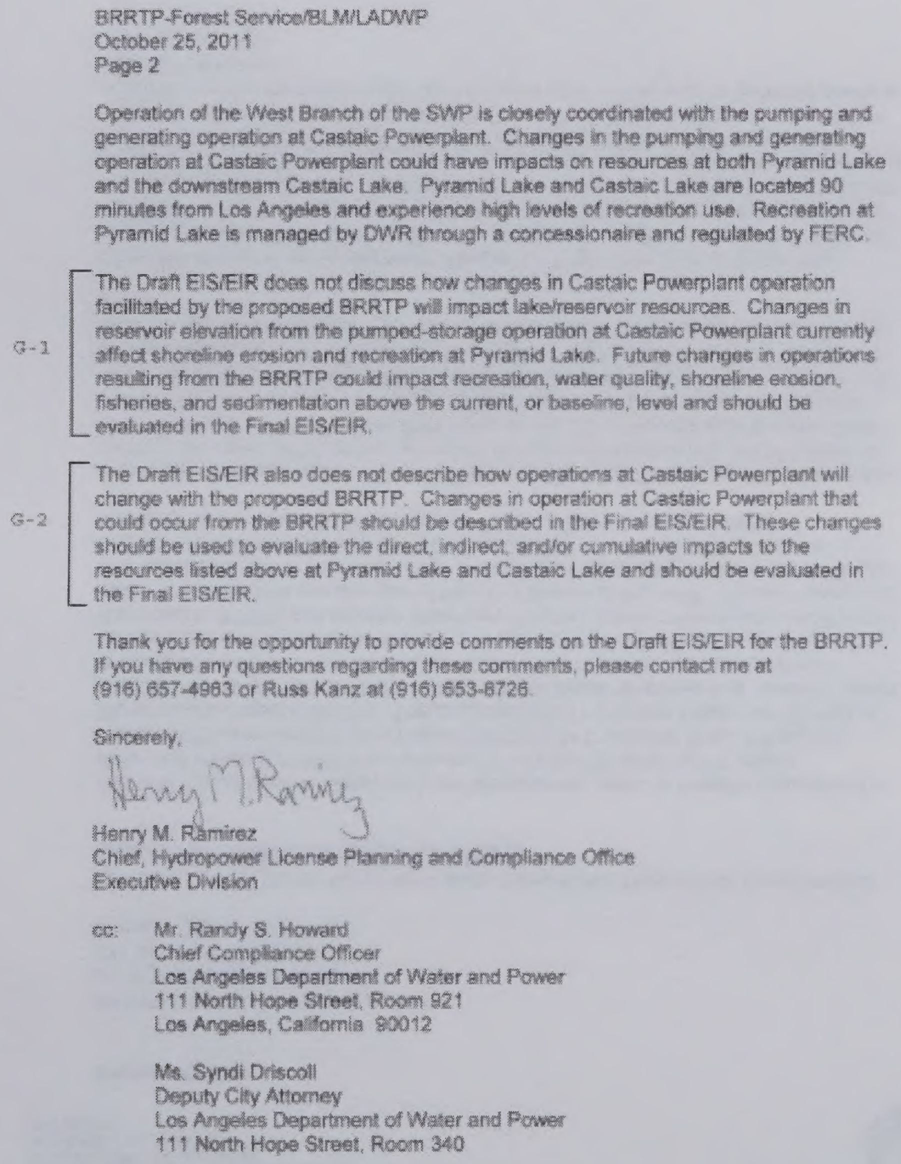
BRRTP-Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, California 92805

Comments on the Barren Ridge Renewable Transmission Project Draft Environmental Impact Statement/Environmental Impact Report

The U.S. Forest Service, Bureau of Land Management, and Los Angeles Department of Water and Power (LADWP) have prepared a joint Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Barren Ridge Renewable Transmission Project (BRRTP). The proposed BRRTP includes addition of 12 miles of new 230 kilovolt (kV) circuit on the existing double circuit structures from Haskell Canyon to Castaic Powerplant. The South State Water Project (SWP) Hydropower Project (formerly named the California Aqueduct) is licensed by the Federal Energy Regulatory Commission (FERC) and includes Elderberry Forebay, Castaic Powerplant, and Pyramid Lake. These facilities are also part of the West Branch of the SWP. Castaic Powerplant was developed, and is operated, under a cooperative agreement between the California Department of Water Resources (DWR) and LADWP. DWR and LADWP are co-licensees for the South SWP Hydropower Project (FERC Project No. 2426).

One of the primary purposes of the BRRTP is to help LADWP meet the 2020 Renewable Portfolio Standard (RPS) goals that require increased generation and use of renewable energy sources. LADWP has an RPS Policy to use 35% renewables by the year 2020. The BRRTP will help achieve this goal by allowing the transmission of wind and solar resources to the Los Angeles Basin, and contribute approximately 22% renewables into LADWP's resource mix. DWR supports the RPS goals mandated by State legislation to increase use of renewable energy resources and reduce the generation of greenhouse gases.

Under the Project Purpose and Need, Section 1.2.5, the Draft EIS/EIR states that matching wind and solar energy production profiles to consumer demand is a challenge for utilities. LADWP requires increased operating flexibility to utilize both wind and solar energy in its power system. The pumped-storage capability of Castaic Powerplant could be used for load balancing when transfer of renewable resources exceeds electrical demand. During periods of high renewable resource generation and low demand, electricity can be used to pump water from Elderberry Forebay to Pyramid Lake. When electrical demand increases, water from Pyramid Lake can be used to generate power at Castaic Powerplant.



BRRTP-Forest Service/BLM/LADWP
October 25, 2011
Page 2

Operation of the West Branch of the SWP is closely coordinated with the pumping and generating operation at Castaic Powerplant. Changes in the pumping and generating operation at Castaic Powerplant could have impacts on resources at both Pyramid Lake and the downstream Castaic Lake. Pyramid Lake and Castaic Lake are located 90 minutes from Los Angeles and experience high levels of recreation use. Recreation at Pyramid Lake is managed by DWR through a concessionaire and regulated by FERC.

G-1 The Draft EIS/EIR does not discuss how changes in Castaic Powerplant operation facilitated by the proposed BRRTP will impact lake/reservoir resources. Changes in reservoir elevation from the pumped-storage operation at Castaic Powerplant currently affect shoreline erosion and recreation at Pyramid Lake. Future changes in operations resulting from the BRRTP could impact recreation, water quality, shoreline erosion, fisheries, and sedimentation above the current, or baseline, level and should be evaluated in the Final EIS/EIR.

G-2 The Draft EIS/EIR also does not describe how operations at Castaic Powerplant will change with the proposed BRRTP. Changes in operation at Castaic Powerplant that could occur from the BRRTP should be described in the Final EIS/EIR. These changes should be used to evaluate the direct, indirect, and/or cumulative impacts to the resources listed above at Pyramid Lake and Castaic Lake and should be evaluated in the Final EIS/EIR.

Thank you for the opportunity to provide comments on the Draft EIS/EIR for the BRRTP. If you have any questions regarding these comments, please contact me at (916) 657-4963 or Russ Kanz at (916) 653-6726.

Sincerely,

Henry M. Ramirez

Henry M. Ramirez
Chief, Hydropower License Planning and Compliance Office
Executive Division

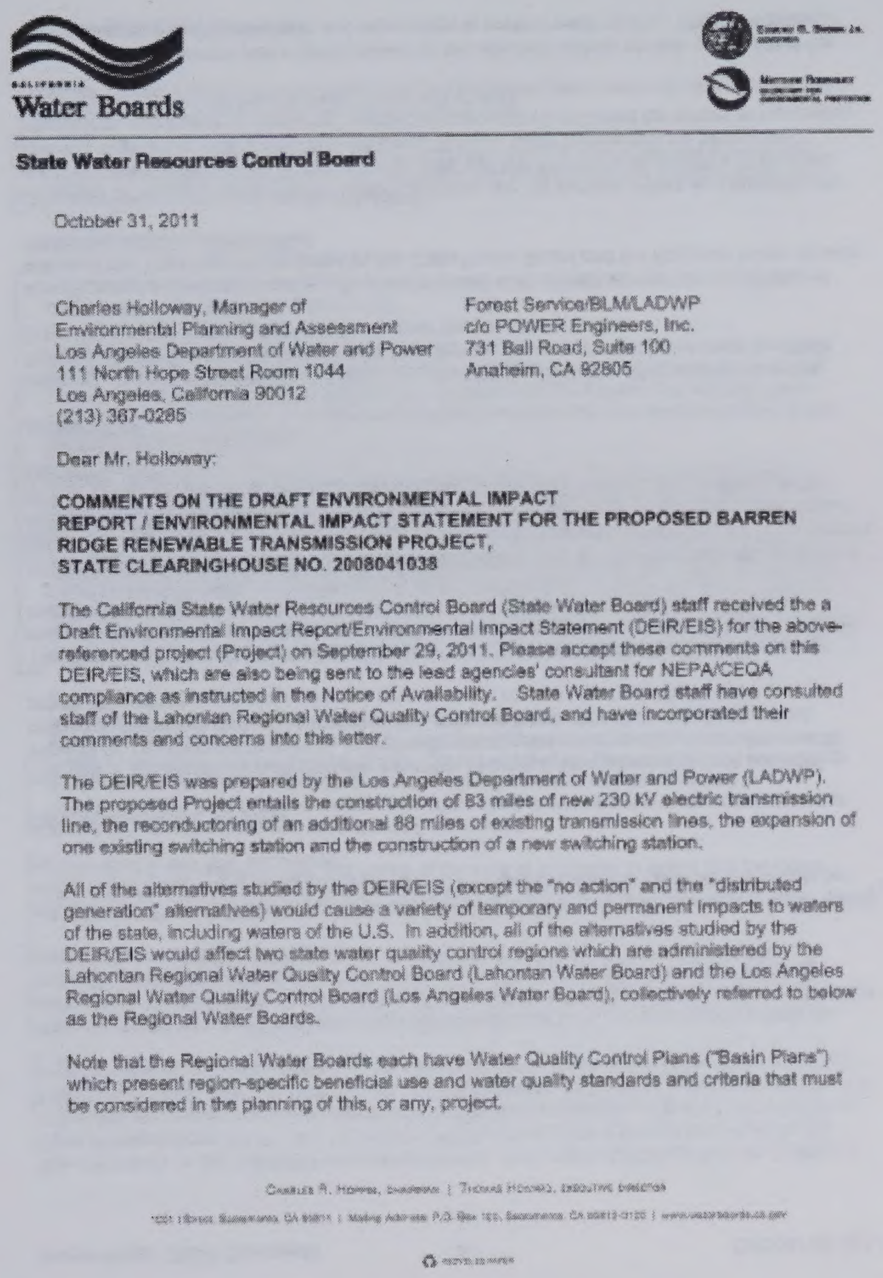
cc: Mr. Randy S. Howard
Chief Compliance Officer
Los Angeles Department of Water and Power
111 North Hope Street, Room 921
Los Angeles, California 90012

Ms. Syndi Driscoll
Deputy City Attorney
Los Angeles Department of Water and Power
111 North Hope Street, Room 340

Response G-1: The integration of the Castaic Power Plant that would occur with the implementation of BRRTP would occur within the existing operational parameters of the Power Plant and would not change or modify the pumping and generating operation at Castaic Power Plant or the agreements with the State Water Project (SWP) for the conveyance and transfer of water. Therefore, the implementation of BRRTP would not have undocumented or undisclosed impacts on the recreation, water quality, shoreline erosion, fisheries, and sedimentation of the current, or baseline, level. Therefore, no direct, indirect, or cumulative impacts are expected.

Response G-2: Please refer to Response G-1. Castaic operations will continue within the licensed and permitted operating parameters and, as such, no impacts to recreation, water resources, or aquatic resources have been identified.

LETTER H: CALIFORNIA STATE WATER RESOURCES CONTROL BOARD



CALIFORNIA
Water Boards

State Water Resources Control Board

October 31, 2011

Charles Holloway, Manager of
Environmental Planning and Assessment
Los Angeles Department of Water and Power
111 North Hope Street Room 1044
Los Angeles, California 90012
(213) 367-0285

Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Dear Mr. Holloway:

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT / ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED BARREN RIDGE RENEWABLE TRANSMISSION PROJECT, STATE CLEARINGHOUSE NO. 2008041038

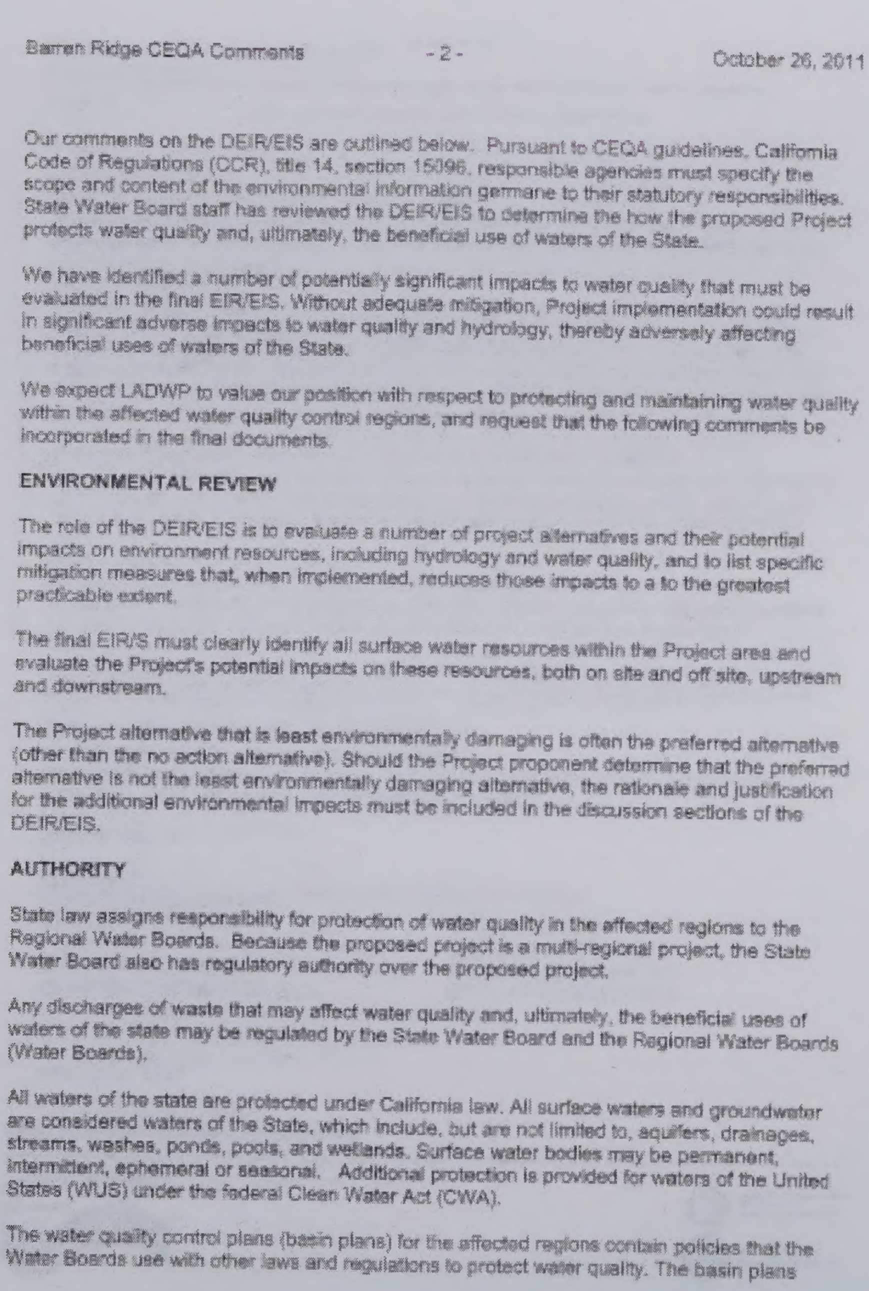
The California State Water Resources Control Board (State Water Board) staff received the a Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) for the above-referenced project (Project) on September 29, 2011. Please accept these comments on this DEIR/EIS, which are also being sent to the lead agencies' consultant for NEPA/CEQA compliance as instructed in the Notice of Availability. State Water Board staff have consulted staff of the Lahontan Regional Water Quality Control Board, and have incorporated their comments and concerns into this letter.

The DEIR/EIS was prepared by the Los Angeles Department of Water and Power (LADWP). The proposed Project entails the construction of 83 miles of new 230 kV electric transmission line, the reconductoring of an additional 88 miles of existing transmission lines, the expansion of one existing switching station and the construction of a new switching station.

All of the alternatives studied by the DEIR/EIS (except the "no action" and the "distributed generation" alternatives) would cause a variety of temporary and permanent impacts to waters of the state, including waters of the U.S. In addition, all of the alternatives studied by the DEIR/EIS would affect two state water quality control regions which are administered by the Lahontan Regional Water Quality Control Board (Lahontan Water Board) and the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board), collectively referred to below as the Regional Water Boards.

Note that the Regional Water Boards each have Water Quality Control Plans ("Basin Plans") which present region-specific beneficial use and water quality standards and criteria that must be considered in the planning of this, or any, project.

Charles R. Hoppin, Chairman | Thomas Howard, Executive Director



Our comments on the DEIR/EIS are outlined below. Pursuant to CEQA guidelines, California Code of Regulations (CCR), title 14, section 15096, responsible agencies must specify the scope and content of the environmental information germane to their statutory responsibilities. State Water Board staff has reviewed the DEIR/EIS to determine the how the proposed Project protects water quality and, ultimately, the beneficial use of waters of the State.

We have identified a number of potentially significant impacts to water quality that must be evaluated in the final EIR/EIS. Without adequate mitigation, Project implementation could result in significant adverse impacts to water quality and hydrology, thereby adversely affecting beneficial uses of waters of the State.

We expect LADWP to value our position with respect to protecting and maintaining water quality within the affected water quality control regions, and request that the following comments be incorporated in the final documents.

ENVIRONMENTAL REVIEW

The role of the DEIR/EIS is to evaluate a number of project alternatives and their potential impacts on environment resources, including hydrology and water quality, and to list specific mitigation measures that, when implemented, reduces those impacts to a to the greatest practicable extent.

The final EIR/S must clearly identify all surface water resources within the Project area and evaluate the Project's potential impacts on these resources, both on site and off site, upstream and downstream.

The Project alternative that is least environmentally damaging is often the preferred alternative (other than the no action alternative). Should the Project proponent determine that the preferred alternative is not the least environmentally damaging alternative, the rationale and justification for the additional environmental impacts must be included in the discussion sections of the DEIR/EIS.

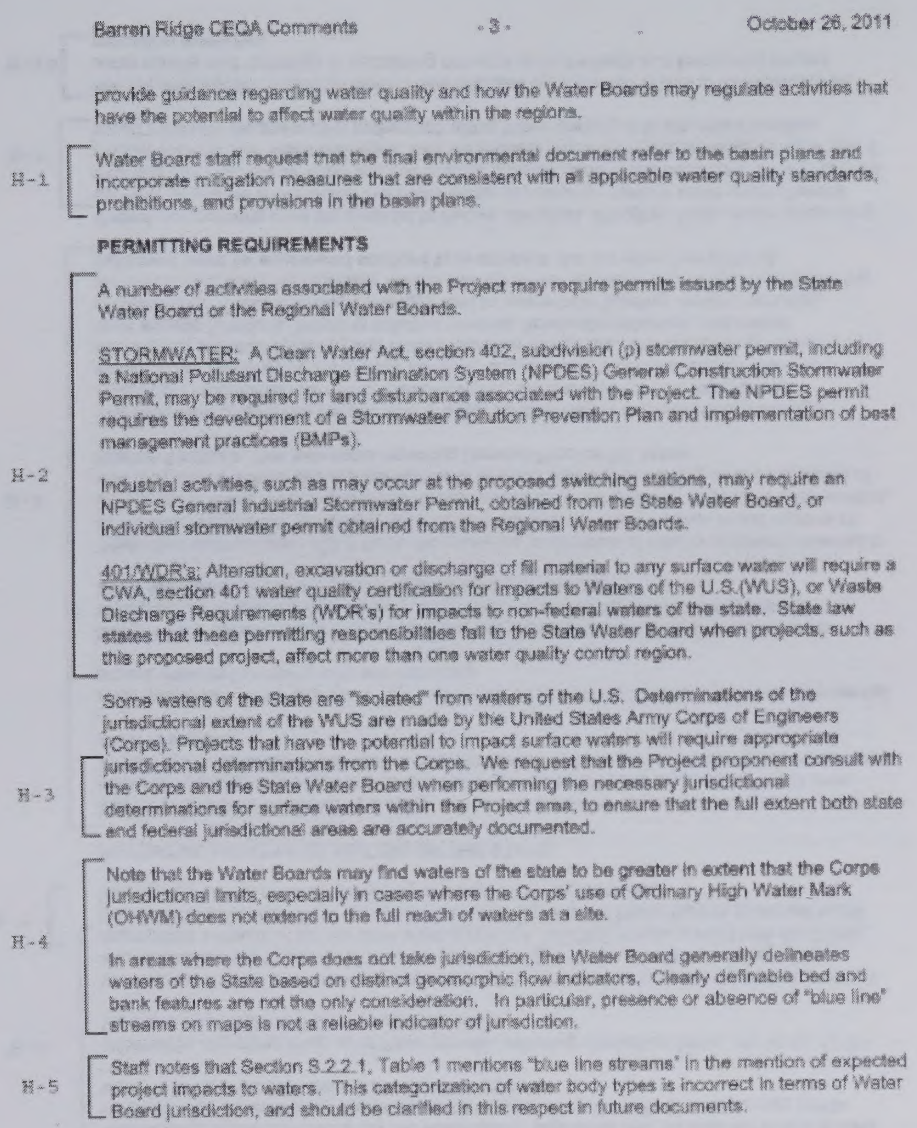
AUTHORITY

State law assigns responsibility for protection of water quality in the affected regions to the Regional Water Boards. Because the proposed project is a multi-regional project, the State Water Board also has regulatory authority over the proposed project.

Any discharges of waste that may affect water quality and, ultimately, the beneficial uses of waters of the state may be regulated by the State Water Board and the Regional Water Boards (Water Boards).

All waters of the state are protected under California law. All surface waters and groundwater are considered waters of the State, which include, but are not limited to, aquifers, drainages, streams, washes, ponds, pools, and wetlands. Surface water bodies may be permanent, intermittent, ephemeral or seasonal. Additional protection is provided for waters of the United States (WUS) under the federal Clean Water Act (CWA).

The water quality control plans (basin plans) for the affected regions contain policies that the Water Boards use with other laws and regulations to protect water quality. The basin plans



provide guidance regarding water quality and how the Water Boards may regulate activities that have the potential to affect water quality within the regions.

H-1 Water Board staff request that the final environmental document refer to the basin plans and incorporate mitigation measures that are consistent with all applicable water quality standards, prohibitions, and provisions in the basin plans.

PERMITTING REQUIREMENTS

H-2 A number of activities associated with the Project may require permits issued by the State Water Board or the Regional Water Boards.

STORMWATER: A Clean Water Act, section 402, subdivision (p) stormwater permit, including a National Pollutant Discharge Elimination System (NPDES) General Construction Stormwater Permit, may be required for land disturbance associated with the Project. The NPDES permit requires the development of a Stormwater Pollution Prevention Plan and implementation of best management practices (BMPs).

Industrial activities, such as may occur at the proposed switching stations, may require an NPDES General Industrial Stormwater Permit, obtained from the State Water Board, or individual stormwater permit obtained from the Regional Water Boards.

401/WDR's: Alteration, excavation or discharge of fill material to any surface water will require a CWA, section 401 water quality certification for impacts to Waters of the U.S.(WUS), or Waste Discharge Requirements (WDR's) for impacts to non-federal waters of the state. State law states that these permitting responsibilities fall to the State Water Board when projects, such as this proposed project, affect more than one water quality control region.

Some waters of the State are "isolated" from waters of the U.S. Determinations of the jurisdictional extent of the WUS are made by the United States Army Corps of Engineers (Corps). Projects that have the potential to impact surface waters will require appropriate

H-3 jurisdictional determinations from the Corps. We request that the Project proponent consult with the Corps and the State Water Board when performing the necessary jurisdictional determinations for surface waters within the Project area, to ensure that the full extent both state and federal jurisdictional areas are accurately documented.

H-4 Note that the Water Boards may find waters of the state to be greater in extent that the Corps jurisdictional limits, especially in cases where the Corps' use of Ordinary High Water Mark (OHWM) does not extend to the full reach of waters at a site.

In areas where the Corps does not take jurisdiction, the Water Board generally delineates waters of the State based on distinct geomorphic flow indicators. Clearly definable bed and bank features are not the only consideration. In particular, presence or absence of "blue line" streams on maps is not a reliable indicator of jurisdiction.

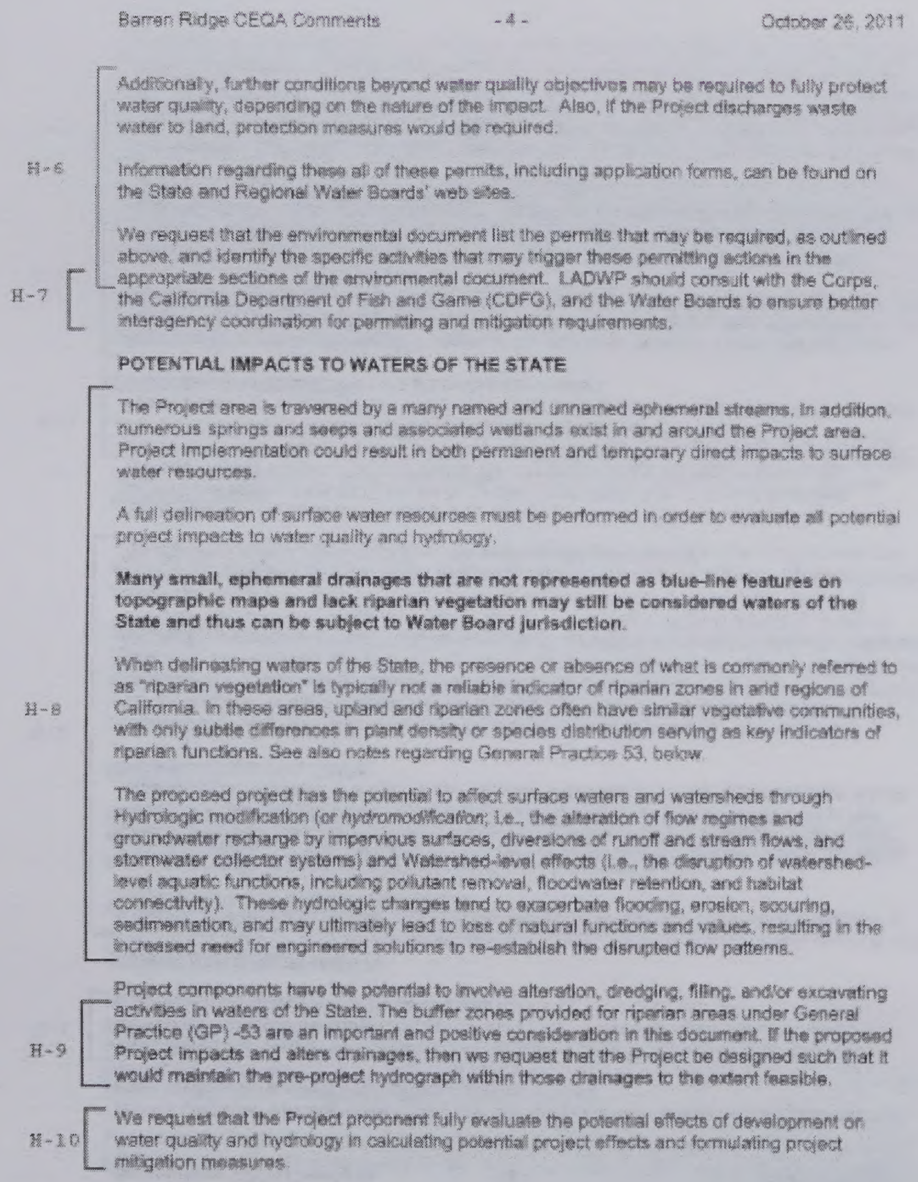
H-5 Staff notes that Section S.2.2.1, Table 1 mentions "blue line streams" in the mention of expected project impacts to waters. This categorization of water body types is incorrect in terms of Water Board jurisdiction, and should be clarified in this respect in future documents.

Response H-1: The basin plans and their requirements were considered in the impacts analysis, and both General Practices and mitigation measures to protect water quality were incorporated. For a discussion of water quality requirements, including basin plan information, please refer to Section 5.9 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR.

Response H-2: State Water Resources Control Board (SWRCB) permitting requirements are included in Table 1-1 of Chapter 1 of Final EIS/EIR, and in Section 2.2 of the Water Resources Technical Report in Volume IV of the Final EIS/EIR. The Project would comply with all applicable federal, State, and local regulations, including permit requirements.

Response H-3: During water resource inventory and impact analysis, all water resources were considered, and potential impacts to them assessed, regardless of jurisdiction (see the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR). If one of the action alternatives is selected, a Jurisdictional Delineation (JD) will be conducted by LADWP to document all surface waters within the Project ROW, including isolated waters/Waters of the State, regardless of jurisdiction. All necessary evaluations to accommodate permitting for water quality protection are Project standards that will be met if any one of the action alternatives is approved. As part of LADWP's determination, both the U.S. Army Corps of Engineers (USACE) and the Regional Water Quality Control Boards (RWQCBs) will be consulted. The lead federal agencies will follow applicable law in requiring LADWP to obtain all necessary CWA permits before construction activities on federal lands are authorized.

Response H-4: As stated above in Response H-3, a JD would be conducted within the Project ROW if the Project is approved. At



Additionally, further conditions beyond water quality objectives may be required to fully protect water quality, depending on the nature of the impact. Also, if the Project discharges waste water to land, protection measures would be required.

H-6 Information regarding these all of these permits, including application forms, can be found on the State and Regional Water Boards' web sites.

We request that the environmental document list the permits that may be required, as outlined above, and identify the specific activities that may trigger these permitting actions in the appropriate sections of the environmental document. H-7 LADWP should consult with the Corps, the California Department of Fish and Game (CDFG), and the Water Boards to ensure better interagency coordination for permitting and mitigation requirements.

POTENTIAL IMPACTS TO WATERS OF THE STATE

The Project area is traversed by a many named and unnamed ephemeral streams, in addition, numerous springs and seeps and associated wetlands exist in and around the Project area. Project implementation could result in both permanent and temporary direct impacts to surface water resources.

A full delineation of surface water resources must be performed in order to evaluate all potential project impacts to water quality and hydrology.

Many small, ephemeral drainages that are not represented as blue-line features on topographic maps and lack riparian vegetation may still be considered waters of the State and thus can be subject to Water Board jurisdiction.

H-8 When delineating waters of the State, the presence or absence of what is commonly referred to as "riparian vegetation" is typically not a reliable indicator of riparian zones in arid regions of California. In these areas, upland and riparian zones often have similar vegetative communities, with only subtle differences in plant density or species distribution serving as key indicators of riparian functions. See also notes regarding General Practice 53, below.

The proposed project has the potential to affect surface waters and watersheds through Hydrologic modification (or *hydromodification*; i.e., the alteration of flow regimes and groundwater recharge by impervious surfaces, diversions of runoff and stream flows, and stormwater collector systems) and Watershed-level effects (i.e., the disruption of watershed-level aquatic functions, including pollutant removal, floodwater retention, and habitat connectivity). These hydrologic changes tend to exacerbate flooding, erosion, scouring, sedimentation, and may ultimately lead to loss of natural functions and values, resulting in the increased need for engineered solutions to re-establish the disrupted flow patterns.

H-9 Project components have the potential to involve alteration, dredging, filling, and/or excavating activities in waters of the State. The buffer zones provided for riparian areas under General Practice (GP) -53 are an important and positive consideration in this document. If the proposed Project impacts and alters drainages, then we request that the Project be designed such that it would maintain the pre-project hydrograph within those drainages to the extent feasible.

H-10 We request that the Project proponent fully evaluate the potential effects of development on water quality and hydrology in calculating potential project effects and formulating project mitigation measures.

that time, the presence and extent of waters and wetlands within the Project ROW will be determined and assessed to determine jurisdiction by LADWP. In addition, both the USACE and the RWQCBs will be consulted.

Response H-5: The term "blue line streams" has been replaced with "intermittent and ephemeral streams" in the text in Section S.2.2.1 of the Executive Summary and other locations in the Final EIS/EIR.

Response H-6: Your comment regarding water quality protections will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP, and it is understood that additional mitigation planning may be required for any of the action alternatives that may be approved. Your suggested sources will be consulted during these activities. An expected list of required permits and activities is included as Table 1-1 in Chapter 1 of the Final EIS/EIR.

Response H-7: LADWP will coordinate with the USACE, CDFG, and the Water Boards to facilitate interagency coordination for permitting and mitigation planning.

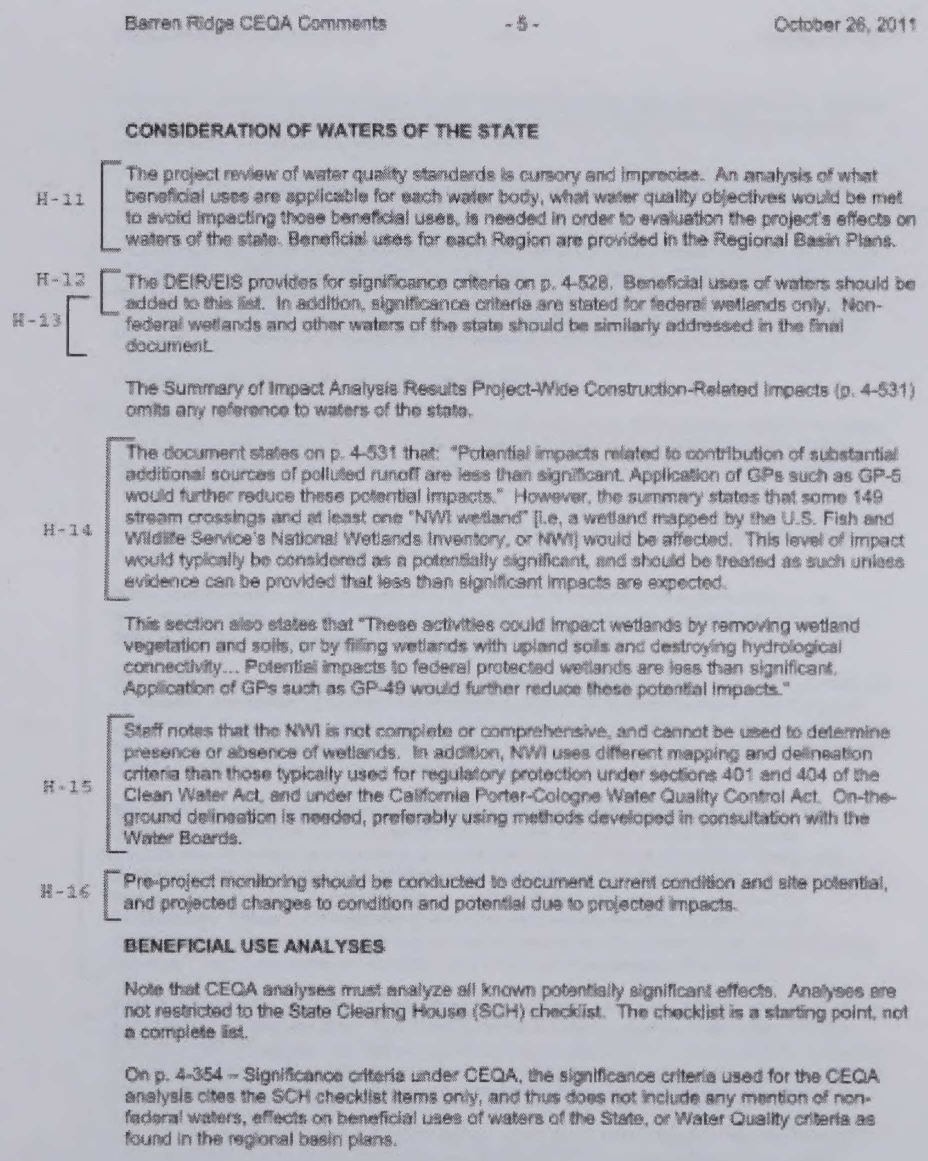
Response H-8: A JD will be conducted during Project permitting when a specific alternative is selected. It is not practical to perform a JD on all alternatives to understand the potential impacts and determine a preferred alternative for water resources. The alternatives were evaluated using a number of primary and secondary data sources, including inventory and assessment of surface water resources mapping by:

- geographic information system (GIS) using the National Hydrography Dataset (NHD)

- geospatial wetlands digital data from the National Wetlands Inventory (NWI)
- high-resolution aerial photography
- U.S. Geological Survey (USGS) topographic maps to assess the location and type of water resources within the Project area

While the NHD and NWI do not typically contain information on ephemeral streams, they were located and mapped using aerial photography combined with field evaluation. This level of information was included in the impact assessment for water resources in the Final EIS/EIR (refer to Section 4.3.3 of Chapter 4). Discussion in the document about potential impacts related to flooding, erosion, sedimentation, etc., include ephemeral streams.

If one of the alternatives is approved through the environmental process, a JD will be conducted that will include all surface waters within the Project ROW, including ephemeral drainages. This delineation will include ephemeral drainages and other potential Waters of the State (California) and Waters of the U.S. The ordinary high water mark or the presence or absence of riparian vegetation are only two of the parameters that will be considered when delineating surface waters; following selection of the approved Project route, LADWP will consult with the RWQCBs, as well as the USACE, prior to conducting the JD to ensure that their concerns are addressed. LADWP will also conduct, during the permitting process, an aerial assessment to determine locations of ephemeral streams in addition to using maps and aerial photography. Please refer to pages 50 through 76, and 84 through 86 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR, for a complete explanation of water resource impacts, including those to ephemeral streams.



CONSIDERATION OF WATERS OF THE STATE

H-11 The project review of water quality standards is cursory and imprecise. An analysis of what beneficial uses are applicable for each water body, what water quality objectives would be met to avoid impacting those beneficial uses, is needed in order to evaluation the project's effects on waters of the state. Beneficial uses for each Region are provided in the Regional Basin Plans.

H-12 The DEIR/EIS provides for significance criteria on p. 4-528. Beneficial uses of waters should be
H-13 added to this list. In addition, significance criteria are stated for federal wetlands only. Non-federal wetlands and other waters of the state should be similarly addressed in the final document.

The Summary of Impact Analysis Results Project-Wide Construction-Related Impacts (p. 4-531) omits any reference to waters of the state.

H-14 The document states on p. 4-531 that: "Potential impacts related to contribution of substantial additional sources of polluted runoff are less than significant. Application of GPs such as GP-5 would further reduce these potential impacts." However, the summary states that some 149 stream crossings and at least one "NWI wetland" [i.e, a wetland mapped by the U.S. Fish and Wildlife Service's National Wetlands Inventory, or NWI] would be affected. This level of impact would typically be considered as a potentially significant, and should be treated as such unless evidence can be provided that less than significant impacts are expected.

This section also states that "These activities could impact wetlands by removing wetland vegetation and soils, or by filling wetlands with upland soils and destroying hydrological connectivity... Potential impacts to federal protected wetlands are less than significant. Application of GPs such as GP-49 would further reduce these potential impacts."

H-15 Staff notes that the NWI is not complete or comprehensive, and cannot be used to determine presence or absence of wetlands. In addition, NWI uses different mapping and delineation criteria than those typically used for regulatory protection under sections 401 and 404 of the Clean Water Act, and under the California Porter-Cologne Water Quality Control Act. On-the-ground delineation is needed, preferably using methods developed in consultation with the Water Boards.

H-16 Pre-project monitoring should be conducted to document current condition and site potential, and projected changes to condition and potential due to projected impacts.

BENEFICIAL USE ANALYSES

Note that CEQA analyses must analyze all known potentially significant effects. Analyses are not restricted to the State Clearing House (SCH) checklist. The checklist is a starting point, not a complete list.

On p. 4-354 – Significance criteria under CEQA, the significance criteria used for the CEQA analysis cites the SCH checklist items only, and thus does not include any mention of non-federal waters, effects on beneficial uses of waters of the State, or Water Quality criteria as found in the regional basin plans.

Response H-9: LADWP supports maintaining pre-project hydrography and will consider your input in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. The mitigation measures included in Table 4.3.3-1 in Chapter 4 of the Final EIS/EIR would ensure that impacts and alternations to drainages would be minimized. HYD-1 and HYD-2 address the construction, operation, and closing of access roads and routes to minimize impacts to water resources. HYD-3 requires that new impervious areas associated with temporary construction be restored to existing conditions after construction. HYD-4 would ensure that drainage within switching station walls would be designed to minimize erosion and increase sediment control. HYD-5 and HYD-6 would require structures and access roads placed with a 100-year floodplain to minimize capture of flood debris and to not impede or redirect flood flows. See also Response H-6 above.

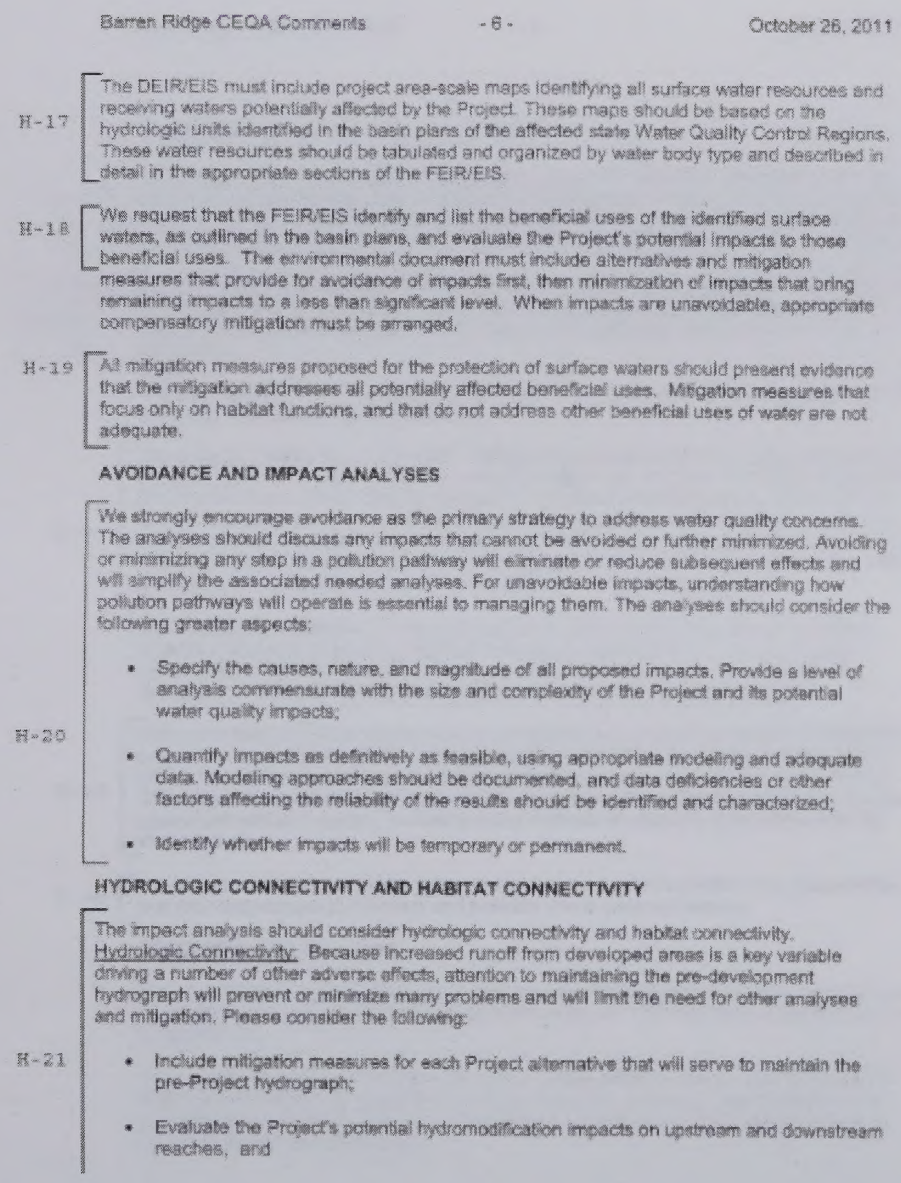
Response H-10: Your comment will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. The potential effects of Project development and operation of the Project on hydrology are described in Chapter 4, Section 4.3.3 of the Final EIS/EIR, Water Resources. Also refer to pages 50 through 76, and 84 through 86 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR As described on page 4-561 of the Final EIS/EIR, Mitigation Measures for water resources (refer to HYD-1 through HYD-7 in Table 4.3.3-1 in Chapter 4 of the Final EIS/EIR) have been developed to be used on a site-specific basis to minimize Project-related impacts.

Response H-11: Section 4.3.3, Water Resources, of the Final EIS/EIR provides a summary of potential impacts to water quality as result of the proposed Project. Water quality objectives and beneficial uses for waters crossed by Project alternatives are discussed in depth in Section 5.9 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. Water quality requirements and beneficial uses were considered in the impact analysis (under the general heading of "Water Quality") and, where potential for impacts were determined, General Practices and mitigation measures were recommended to minimize or avoid such impacts (see pages 51 through 55 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR). Types of impacts, including those to water quality and beneficial uses, are discussed in Section 6.5.1 of the Water Resources Technical Report. Results of the impact analysis are discussed in detail in Section 7 and Section 8.3 of the Water Resources Technical Report.

Response H-12: The significance criteria on page 4-559 and 4-560 of the Final EIS/EIR are adapted from Appendix G of the 2011 CEQA Statutes and Guidelines. While potential impacts to beneficial uses were not listed as an individual criterion, potential effects to beneficial uses were considered in the impact assessment (see pages 38 through 40 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR).

Response H-13: The CEQA significance criterion specifies: "Have a substantial effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.)." Pending a jurisdictional delineation, all potential wetlands identified along each alternative were inventoried and considered during the impact analysis, regardless of jurisdiction.

Response H-14: Refer to Response H-9. Section 4.3.3 of the Final EIS/EIR discusses potential impacts that could occur if not for General Practices and mitigation measures. Because the alternatives would almost wholly be parallel to existing linear



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H-17 The DEIR/EIS must include project area-scale maps identifying all surface water resources and receiving waters potentially affected by the Project. These maps should be based on the hydrologic units identified in the basin plans of the affected state Water Quality Control Regions. These water resources should be tabulated and organized by water body type and described in detail in the appropriate sections of the FEIR/EIS.

H-18 We request that the FEIR/EIS identify and list the beneficial uses of the identified surface waters, as outlined in the basin plans, and evaluate the Project's potential impacts to those beneficial uses. The environmental document must include alternatives and mitigation measures that provide for avoidance of impacts first, then minimization of impacts that bring remaining impacts to a less than significant level. When impacts are unavoidable, appropriate compensatory mitigation must be arranged.

H-19 All mitigation measures proposed for the protection of surface waters should present evidence that the mitigation addresses all potentially affected beneficial uses. Mitigation measures that focus only on habitat functions, and that do not address other beneficial uses of water are not adequate.

AVOIDANCE AND IMPACT ANALYSES

H-20 We strongly encourage avoidance as the primary strategy to address water quality concerns. The analyses should discuss any impacts that cannot be avoided or further minimized. Avoiding or minimizing any step in a pollution pathway will eliminate or reduce subsequent effects and will simplify the associated needed analyses. For unavoidable impacts, understanding how pollution pathways will operate is essential to managing them. The analyses should consider the following greater aspects:

- Specify the causes, nature, and magnitude of all proposed impacts. Provide a level of analysis commensurate with the size and complexity of the Project and its potential water quality impacts;
- Quantify impacts as definitively as feasible, using appropriate modeling and adequate data. Modeling approaches should be documented, and data deficiencies or other factors affecting the reliability of the results should be identified and characterized;
- Identify whether impacts will be temporary or permanent.

HYDROLOGIC CONNECTIVITY AND HABITAT CONNECTIVITY

H-21 The impact analysis should consider hydrologic connectivity and habitat connectivity. Hydrologic Connectivity: Because increased runoff from developed areas is a key variable driving a number of other adverse effects, attention to maintaining the pre-development hydrograph will prevent or minimize many problems and will limit the need for other analyses and mitigation. Please consider the following:

- Include mitigation measures for each Project alternative that will serve to maintain the pre-Project hydrograph;
- Evaluate the Project's potential hydromodification impacts on upstream and downstream reaches, and

features that already have established access networks, streams would be crossed by existing roads, and all wetlands would be avoided or spanned (crossed only by overhead wires). When the text says these resources would be "crossed," it typically means an aerial crossing—spanning of the resources—rather than with physical ground disturbance or dredging and filling of streams or wetlands. As such, with application of General Practices and applicable mitigation measures, impacts related to the contribution of substantial additional sources of polluted runoff would, in fact, be less than significant (refer to page 4-561 of the Final EIS/EIR).

Response H-15: We acknowledge that NWI is not complete or comprehensive, and cannot be used to determine presence or absence of wetlands. In the Final EIS/EIR, NWI is used as a reference and guide for the potential presence of wetlands. A JD will be conducted during Project permitting and after the selection one of the alternatives. As described in Response H-8, the NWI was just one of the methods used to determine the likely presence of wetlands. The presence of wetlands was assumed if there was a question, and all identified wetlands from the inventory of the alternatives were included in the impact assessment. If an action alternative is approved, a JD would be conducted to inventory and assess potential impacts to all Waters of the State and U.S., including wetlands, within the Project ROW.

Response H-16: Current resource conditions would be documented in detail as required during the JD prior to construction, and all findings would be included in the JD report.

Response H-17: Detailed maps covering each of the alternative routes, such as you describe, would require multiple large map books to cover the over 200 miles of alternative routes. It is not reasonable to include such extensive mapping in the Draft or Final EIS/EIR. However, if one of the action alternatives is selected, maps of a similar type and scale that you suggest will be produced and provided, as required, to resource and permitting agencies, including the RWQCBs, as part of the permitting and pre-construction phase of the Project.

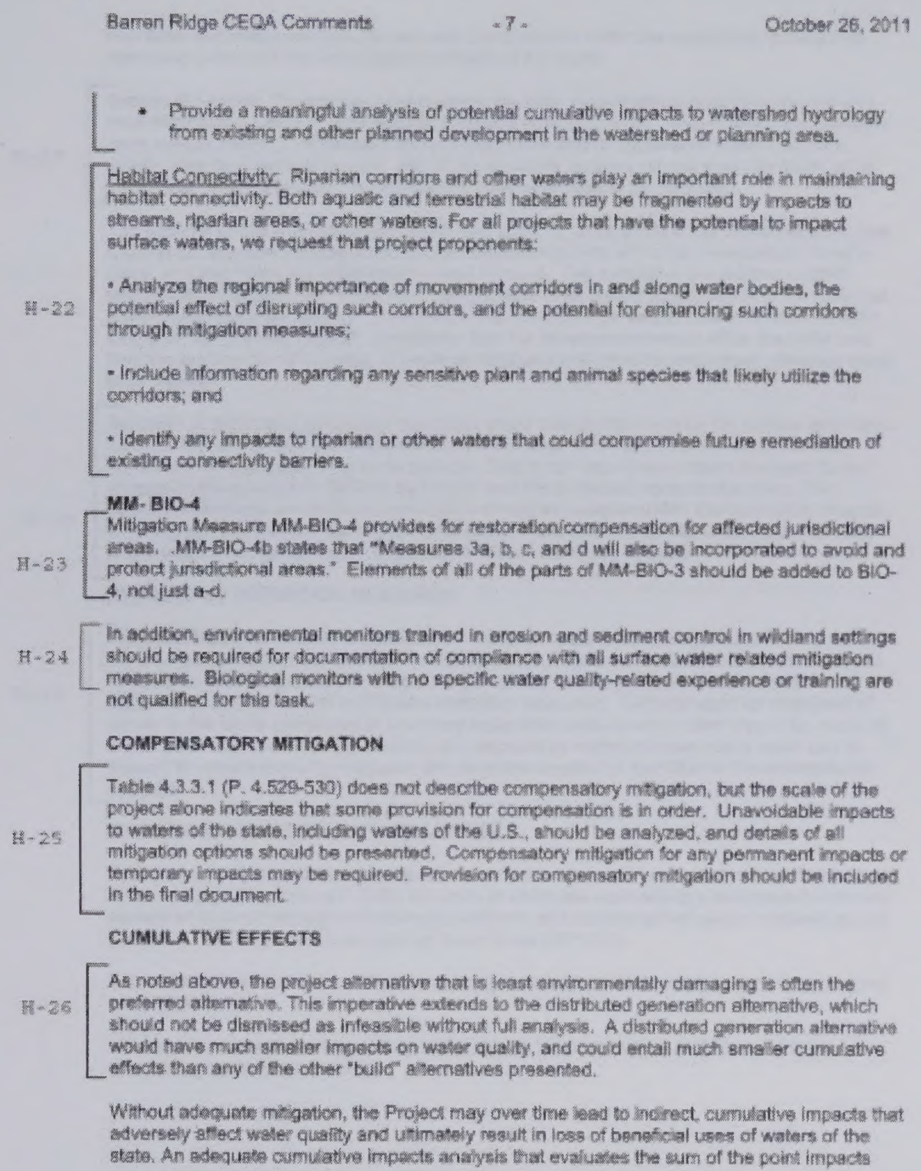
Response H-18: The potential impacts to water resources, including beneficial impacts, were considered during the impact analysis. Beneficial uses, as described in the appropriate basin plans, are also discussed on pages 38 through 40 of Section 5.9 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. After application of General Practices and appropriate mitigation measures, the residual impacts were identified to be less than significant. Compensatory mitigation for unavoidable impacts would be applied, as applicable, through the Project permitting process.

Response H-19: Because the alternatives would almost wholly be parallel to existing linear features that already have established access networks, streams would be crossed by existing roads, and wetlands would be avoided or spanned (crossed only by overhead wires) to the greatest extent possible. The seven specifically recommended mitigation measures proposed to protect water resources are not the only measures proposed to protect water resources, but they do include water quality and beneficial uses. Please refer to Section 6.5, pages 50 through 54 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR, for information on General Practices that would protect water quality, including beneficial uses. Please note that "beneficial uses" were considered as part of overall water quality; while they were not specifically called out, they were considered during the impact analysis, and measures (i.e., General Practices and mitigation measures) have been proposed that would also protect beneficial uses of affected surface waters.

Response H-20: Avoidance is being used as an effective mitigation measure for water resources. Please refer to Section 6.4 (pages 49 through 50) of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR, for a discussion of impact assessment methodology; Section 6.5.1 (pages 55 through 58) of this report for a discussion of construction-related (temporary) vs. operation-related (permanent) impacts; and Section 7.0 (pages 59 through 76), as well as Section 8.3 (pages 84 through 86) for a presentation of the impact analysis results, which does include the causes, nature, and magnitude of the impacts. Because the alternatives would almost wholly be parallel to existing linear features that already have established access networks, streams would be crossed by existing roads, and wetlands would be avoided or spanned (crossed only by overhead wires) to the greatest extent possible. As part of LADWP's design process, LADWP will be determining those areas that will be considered "no–construction-work" areas or "no-tower-placement" areas.

Response H-21: General Practices have been developed that will serve to maintain the pre-Project hydrograph, primarily through avoidance where feasible; for a description of General Practices related to water resources, please refer to Table 6-2 on pages 51 through 54 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. An analysis of any potential hydromodification impacts on upstream and downstream reaches will be conducted during the permitting stage, as required, and when a survey of specific streambeds could be conducted.

The ANF requested an evaluation of the potential for Project-related erosion and related changes to hydrology of ANF lands that could result from construction of each alternative. Subsequently, two models were utilized to analyze effects of construction and operation of the Project alternatives on sedimentation and erosion. A Revised Universal Soil Loss Equation (RUSLE) analysis was



- Provide a meaningful analysis of potential cumulative impacts to watershed hydrology from existing and other planned development in the watershed or planning area.

H-22 Habitat Connectivity: Riparian corridors and other waters play an important role in maintaining habitat connectivity. Both aquatic and terrestrial habitat may be fragmented by impacts to streams, riparian areas, or other waters. For all projects that have the potential to impact surface waters, we request that project proponents:

- Analyze the regional importance of movement corridors in and along water bodies, the potential effect of disrupting such corridors, and the potential for enhancing such corridors through mitigation measures;

- Include information regarding any sensitive plant and animal species that likely utilize the corridors; and

- Identify any impacts to riparian or other waters that could compromise future remediation of existing connectivity barriers.

MM- BIO-4

H-23 Mitigation Measure MM-BIO-4 provides for restoration/compensation for affected jurisdictional areas. .MM-BIO-4b states that "Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas." Elements of all of the parts of MM-BIO-3 should be added to BIO-4, not just a-d.

H-24 In addition, environmental monitors trained in erosion and sediment control in wildland settings should be required for documentation of compliance with all surface water related mitigation measures. Biological monitors with no specific water quality-related experience or training are not qualified for this task.

COMPENSATORY MITIGATION

H-25 Table 4.3.3.1 (P. 4.529-530) does not describe compensatory mitigation, but the scale of the project alone indicates that some provision for compensation is in order. Unavoidable impacts to waters of the state, including waters of the U.S., should be analyzed, and details of all mitigation options should be presented. Compensatory mitigation for any permanent impacts or temporary impacts may be required. Provision for compensatory mitigation should be included in the final document.

CUMULATIVE EFFECTS

H-26 As noted above, the project alternative that is least environmentally damaging is often the preferred alternative. This imperative extends to the distributed generation alternative, which should not be dismissed as infeasible without full analysis. A distributed generation alternative would have much smaller impacts on water quality, and could entail much smaller cumulative effects than any of the other "build" alternatives presented.

Without adequate mitigation, the Project may over time lead to indirect, cumulative impacts that adversely affect water quality and ultimately result in loss of beneficial uses of waters of the state. An adequate cumulative impacts analysis that evaluates the sum of the point impacts

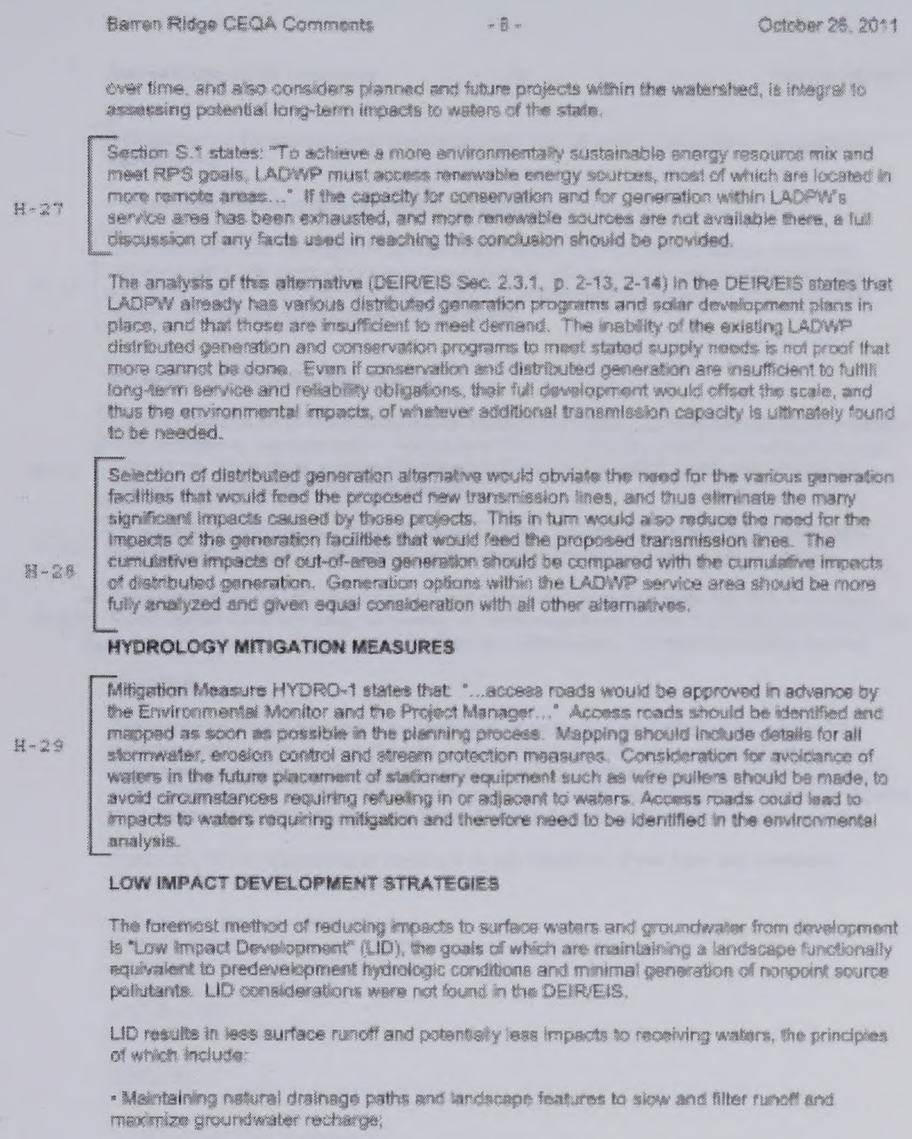
prepared to predict the rate of erosion that would potentially result from construction and operation of the BRRTP within the ANF. Furthermore, a statistical analysis (WinTR-55) of affected sixth-level watersheds within the ANF was performed to predict peak flow within the watersheds pre- and post-construction. The results of these analyses were incorporated into the impact assessment for each Project alternative, and adverse effects were determined to be less than significant for each alternative. For details of these analyses, please refer to the BRRTP Water Resources and Hydrology Supplemental Technical Report, located in Volume IV of the Final EIS/EIR; results of the RUSLE analysis are located in Appendix A of the BRRTP Water Resources and Hydrology Supplemental Technical Report.

Response H-22: A detailed analysis is documented in Section 4.3.1, Biological Resources, of the Final EIS/EIR to address movement corridors and information regarding sensitive plants and animal species that potentially utilize these corridors. Interference with movements of native species along corridors was included in the significance criteria used to evaluate impact to biological resources (see page 4-345 of the Final EIS/EIR). The South Coast Missing Linkages project developed a comprehensive plan for maintaining and restoring critical habitat linkages between existing reserves or protected lands (South Coast Wildlands 2008). In addition to the data provided by South Coast Missing Linkages, RCA surveys were performed on National Forest lands to identify and analyze potential impacts to the movement corridors and species that utilize these corridors on the ANF. RCAs combine the ecologic concerns of riparian ecosystems with the hydrologic concerns of floodplains and streamside slopes. The term "RCA" applies only to National Forest lands; the goal of establishing an RCA is to protect, maintain, or improve water quality, site productivity, channel stability, riparian vegetation, and riparian-dependent species and habitats (USFS 2005). Each Alternative analyzed in Chapter 4, Section 4.3.1, Biological Resources, of the Final EIS/EIR identified movement corridors, including RCAs, and analyzed the potential effect of disturbing such corridors. Information regarding potential impacts to wildlife corridors can be found in Tables 4.3.1-2, 4.3.1-5, 4.3.1-9, 4.3.1-10, and 4.3.1-13 of the Final EIS/EIR. Additionally, mitigation measures BIO-3 and BIO-4 outline how the Project would incorporate riparian area avoidance and permit measures.

Response H-23: Mitigation measures BIO-3a through f are standalone mitigation measures that would be implemented in addition to all permit conditions detailed within the individual or Nationwide permit and RWQCB Section 401 water quality certification, in addition to BIO-4a and 4b. These mitigation measures should be viewed as additive, rather than mutually exclusive. Nothing substantive or any increased risk would result from combining these measures; therefore, we propose to leave our mitigation measures in their current form.

Response H-24: As required by SWRCB regulations (Construction General Permit Order 2009-0009-DWQ), the Project will have a State-certified Qualified Storm Water Pollution Prevention Program (SWPPP) Practitioner (QSP) or its delegated representative on site at all times during construction and would ensure compliance with surface water-related mitigation measures.

Response H-25: Refer to Response H-8, Response H-9, and Response H-21. A JD will be conducted when the final Project route is selected. Pending a JD to determine the exact location, boundaries, and size of any Waters of the State and Waters of the U.S. that would be affected by the Project, site-specific impacts to these waters, if any, cannot be quantified, and sufficient information is unavailable for a compensatory mitigation plan. When the JD has been conducted and unavoidable impacts, if any,



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over time, and also considers planned and future projects within the watershed, is integral to assessing potential long-term impacts to waters of the state.

H-27 Section S.1 states: "To achieve a more environmentally sustainable energy resource mix and meet RPS goals, LADWP must access renewable energy sources, most of which are located in more remote areas…" If the capacity for conservation and for generation within LADPW's service area has been exhausted, and more renewable sources are not available there, a full discussion of any facts used in reaching this conclusion should be provided.

The analysis of this alternative (DEIR/EIS Sec. 2.3.1, p. 2-13, 2-14) in the DEIR/EIS states that LADPW already has various distributed generation programs and solar development plans in place, and that those are insufficient to meet demand. The inability of the existing LADWP distributed generation and conservation programs to meet stated supply needs is not proof that more cannot be done. Even if conservation and distributed generation are insufficient to fulfill long-term service and reliability obligations, their full development would offset the scale, and thus the environmental impacts, of whatever additional transmission capacity is ultimately found to be needed.

H-28 Selection of distributed generation alternative would obviate the need for the various generation facilities that would feed the proposed new transmission lines, and thus eliminate the many significant impacts caused by those projects. This in turn would also reduce the need for the impacts of the generation facilities that would feed the proposed transmission lines. The cumulative impacts of out-of-area generation should be compared with the cumulative impacts of distributed generation. Generation options within the LADWP service area should be more fully analyzed and given equal consideration with all other alternatives.

HYDROLOGY MITIGATION MEASURES

H-29 Mitigation Measure HYDRO-1 states that: "…access roads would be approved in advance by the Environmental Monitor and the Project Manager…" Access roads should be identified and mapped as soon as possible in the planning process. Mapping should include details for all stormwater, erosion control and stream protection measures. Consideration for avoidance of waters in the future placement of stationery equipment such as wire pullers should be made, to avoid circumstances requiring refueling in or adjacent to waters. Access roads could lead to impacts to waters requiring mitigation and therefore need to be identified in the environmental analysis.

LOW IMPACT DEVELOPMENT STRATEGIES

The foremost method of reducing impacts to surface waters and groundwater from development is "Low Impact Development" (LID), the goals of which are maintaining a landscape functionally equivalent to predevelopment hydrologic conditions and minimal generation of nonpoint source pollutants. LID considerations were not found in the DEIR/EIS.

LID results in less surface runoff and potentially less impacts to receiving waters, the principles of which include:

- Maintaining natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge;

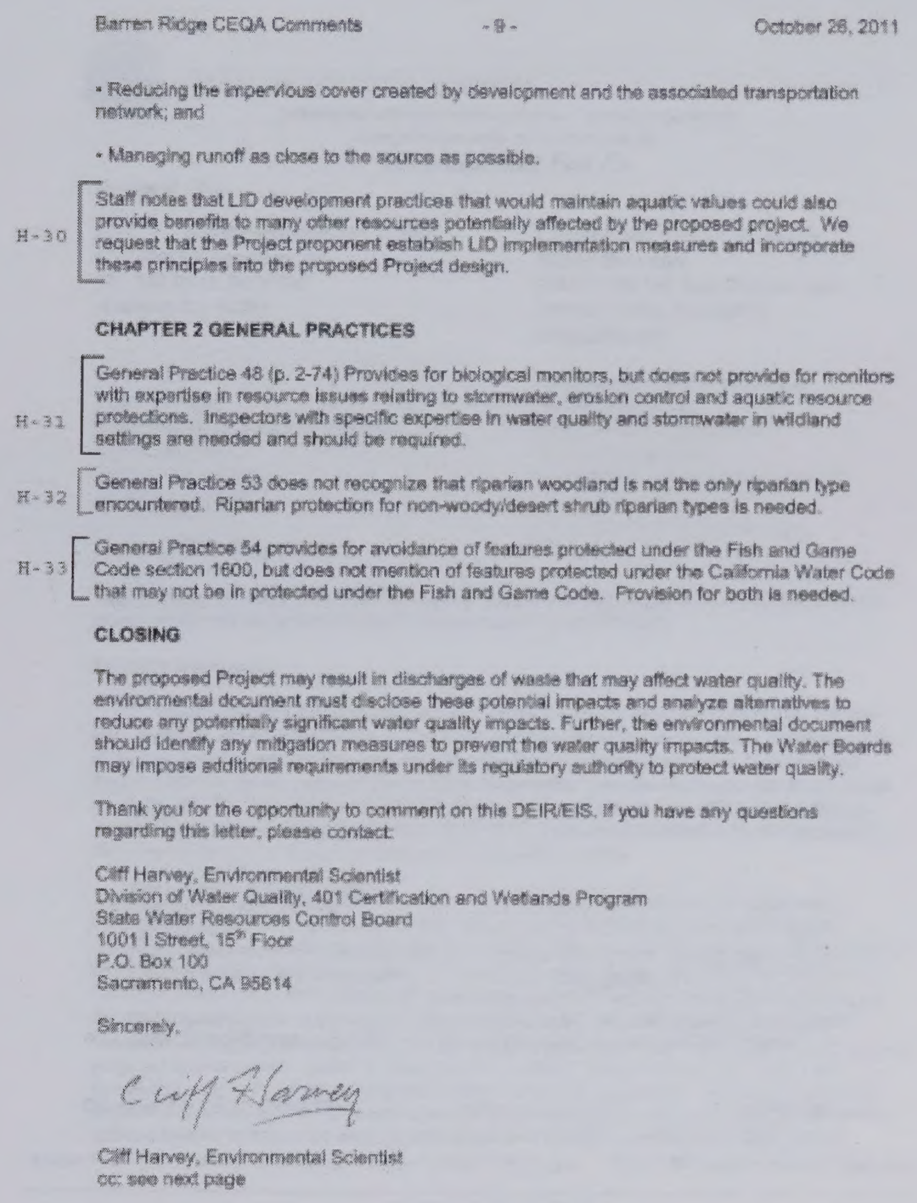
are known, any required compensatory mitigation plan will be provided as part of the permitting process and the Construction, Operation, and Maintenance Plan submitted to the USFS and the BLM.

Response H-26: Distributed generation was considered and eliminated from detailed consideration for the factors identified on pages 2-13 through 2-14 of Chapter 2 of the Final EIS/EIR. Although it is acknowledged that distributed generation would avoid many environmental impacts, additional facilities needed to fully implement such a system would create their own environmental impacts. LADWP's existing distributed generation programs have already been included in the utility's projected RPS goals, and would not by themselves meet those goals. Distributed generation alone would also not allow for increased reliability and flexibility of LADWP's overall grid. As such, this alternative would not meet the purpose and need for the action, and was not studied in detail in the Draft or Final EIS/EIR. Refer to the Alternatives Development Report, included as Appendix B to the Final EIS/EIR, and Chapter 2 of the Final EIS/EIR, Section 2.3, for a full discussion of the consideration of alternative technologies, including distributed generation.

Response H-27: LADWP has very aggressive programs to promote customer energy efficiency and local renewable energy development. By 2030, LADWP anticipates the savings of over 2,300 gigawatt hours (GWh) of electricity through customer energy efficiency programs such as the Consumer Rebate Program, the Refrigerator Turn-In and Recycle Program, and the Solar Incentive Program. This is nearly 10% of the current electricity use in Los Angeles. LADWP also plans to more than double renewable energy generation in the Los Angeles basin to about 1,200 GWh per year by 2030, primarily from local solar programs. Even with this significant increase in local renewables, LADWP will still need to increase renewable energy production by over 4,000 GWh from other sources outside of Los Angeles, where the renewable energy resources are located, to meet legal mandates for renewable energy production as well as load growth. This information can be found in LADWP's 2011 Integrated Resource Plan on the LADWP website (http://www.ladwp.com/ladwp/cms/ladwp001967.jsp).

Response H-28: Refer to Response H-26 above. A distributed generation alternative would not meet the Project's basic purpose and need/objectives; therefore, a detailed analysis, including analysis of cumulative impacts, is unnecessary.

Response H-29: Because the alternatives would almost wholly be parallel to existing linear features that already have established access networks, streams would be crossed by existing roads, and wetlands would be avoided or spanned (crossed only by overhead wires) to the greatest extent possible. Access roads would be mapped during final design if one of the action alternatives is selected through this process. Final design will include details for stormwater, erosion, and stream protection measures as appropriate. While the exact location of Project access roads (e.g., spurs from existing roads) is not currently known, most of the required access would be along existing roads for all alternatives, with the notable exception of approximately seven miles of Alternative 1. Estimates of ground disturbance associated with access roads are documented in Table 2-4 on page 2-72 of the Final EIS/EIR. Subsequently, potential impacts from access roads were considered in the impact analysis for most of the resources described in Chapter 4 of the Final EIS/EIR. Specifically for the Water Resources analysis, access roads were incorporated into the development of the impact assessment model through the use of temporary and permanent ground disturbance estimates as detailed in Appendix A to the Water Resources Technical Report.



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- Reducing the impervious cover created by development and the associated transportation network; and

- Managing runoff as close to the source as possible.

H-30 Staff notes that LID development practices that would maintain aquatic values could also provide benefits to many other resources potentially affected by the proposed project. We request that the Project proponent establish LID implementation measures and incorporate these principles into the proposed Project design.

CHAPTER 2 GENERAL PRACTICES

H-31 General Practice 48 (p. 2-74) Provides for biological monitors, but does not provide for monitors with expertise in resource issues relating to stormwater, erosion control and aquatic resource protections. Inspectors with specific experties in water quality and stormwater in wildland settings are needed and should be required.

H-32 General Practice 53 does not recognize that riparian woodland is not the only riparian type encountered. Riparian protection for non-woody/desert shrub riparian types is needed.

H-33 General Practice 54 provides for avoidance of features protected under the Fish and Game Code section 1600, but does not mention of features protected under the California Water Code that may not be in protected under the Fish and Game Code. Provision for both is needed.

CLOSING

The proposed Project may result in discharges of waste that may affect water quality. The environmental document must disclose these potential impacts and analyze alternatives to reduce any potentially significant water quality impacts. Further, the environmental document should identify any mitigation measures to prevent the water quality impacts. The Water Boards may impose additional requirements under its regulatory authority to protect water quality.

Thank you for the opportunity to comment on this DEIR/EIS. If you have any questions regarding this letter, please contact:

Cliff Harvey, Environmental Scientist
Division of Water Quality, 401 Certification and Wetlands Program
State Water Resources Control Board
1001 I Street, 15th Floor
P.O. Box 100
Sacramento, CA 95814

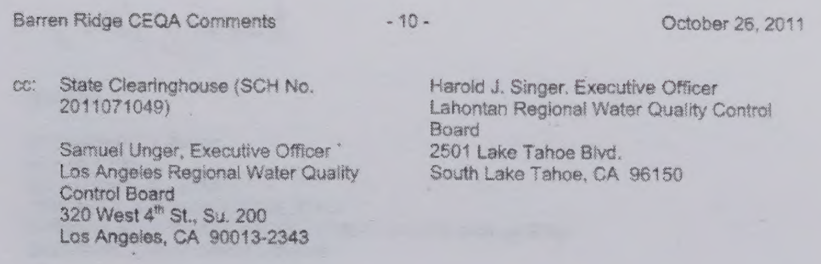
Sincerely,

Cliff Harvey

Cliff Harvey, Environmental Scientist
cc: see next page

With regards to refueling adjacent to or nearby waters: it is LADWP's practice to avoid if possible any refueling or vehicle maintenance adjacent to or nearby any water bodies. These practices will be documented and stipulated in the SWPPP. Refueling and vehicle maintenance activities will have designated areas as required. Additionally, General Practices, such as GP-5, GP-7, GP-19, GP-53, and GP-54 and mitigation measures HYD-1 through HYD-7 are in place to address potential impacts that could result from refueling activities or Project access roads. The mitigation measure in question, HYD-1, is a contingency mitigation measure to be used in the event the planned access road would not be used for some reason (e.g., storm damage). Potential impacts resulting from use of existing access roads was included in the environmental analysis, including a RUSLE (Revised Universal Soil Loss Equation) analysis to predict the rate of erosion that would potentially result from construction and operation of the BRRTP within the ANF and a statistical analysis (WinTR-55) of affected sixth-level watersheds within the ANF was performed to predict peak flow within the watersheds pre- and post-construction. These analyses are located in Appendices A, B, and C of the BRRTP Water Resources and Hydrology Supplemental Technical Report in Appendix IV of the Final EIS/EIR.

Response H-30: The Project has included Low Impact Development practices into the Project design to the extent feasible. For the General Practices specific to water resources, please refer to Table 6-2, General Practices, located on pages 51 through 54 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. If one of the action Alternatives is selected, low impact development implementation measures will be incorporated where feasible.



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cc: State Clearinghouse (SCH No. 2011071049)

Samuel Unger, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th St., Su. 200
Los Angeles, CA 90013-2343

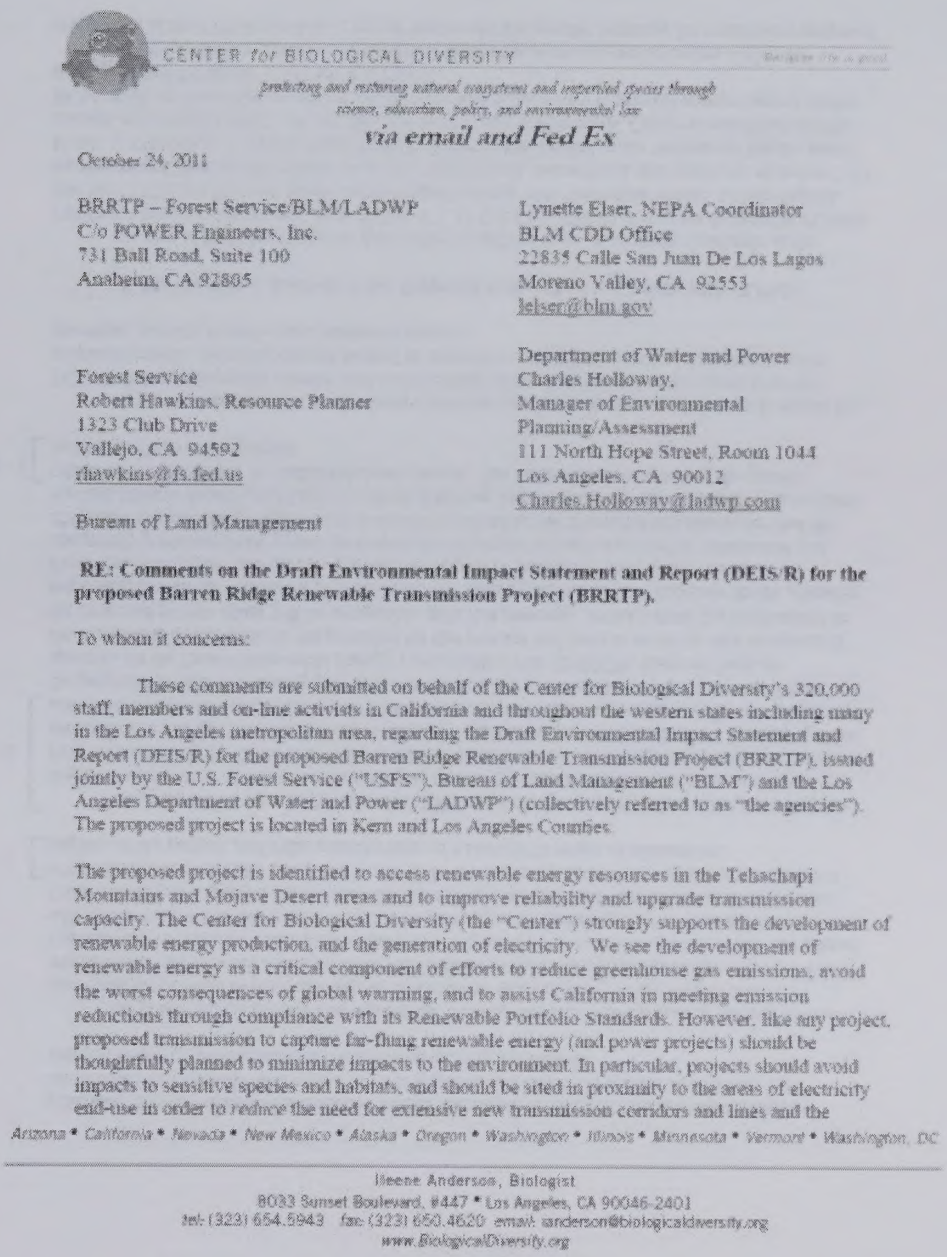
Harold J. Singer, Executive Officer
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Response H-31: See Response H-24. As required by Construction General Permit Order 2009-0009-DWQ, the Project will have at least one State-certified QSP or its delegated representative on site at all times during construction activities for the Project. In addition, a State-certified Qualified SWPPP Developer (QSD) will visit the site as needed to check on the effectiveness of the best management practices (BMPs) to be implemented to protect water quality and low impact development implementation. The QSD and QSP will be in close communication throughout the duration of the Project to ensure the proper protection of water quality. Per General Practice GP-48, a biological monitor will also be present during ground disturbing activities in environmentally sensitive areas including streams, wetlands, and riparian areas.

Response H-32: GP-53 has been revised to require exclusion zones around all identified riparian areas (see page 2-91 of the Final EIS/EIR). The reference to riparian woodlands has been eliminated.

Response H-33: GP-54 is specific to Section 1600 of the Fish and Game Code; however, this is not meant to imply that only those resources protected under Section 1600 will be considered. The Project would comply with all applicable federal, State, and local regulatory requirements that protect surface water and groundwater, including California Water Code.

LETTER I: CENTER FOR BIOLOGICAL DIVERSITY



CENTER for BIOLOGICAL DIVERSITY
Because life is good
protecting and restoring natural ecosystems and imperiled species through science, education, policy, and environmental law

via email and Fed Ex

October 24, 2011

BRRTP – Forest Service/BLM/LADWP
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Bureau of Land Management

RE: Comments on the Draft Environmental Impact Statement and Report (DEIS/R) for the proposed Barren Ridge Renewable Transmission Project (BRRTP).

To whom it concerns:

These comments are submitted on behalf of the Center for Biological Diversity's 320,000 staff, members and on-line activists in California and throughout the western states including many in the Los Angeles metropolitan area, regarding the Draft Environmental Impact Statement and Report (DEIS/R) for the proposed Barren Ridge Renewable Transmission Project (BRRTP), issued jointly by the U.S. Forest Service ("USFS"), Bureau of Land Management ("BLM") and the Los Angeles Department of Water and Power ("LADWP") (collectively referred to as "the agencies"). The proposed project is located in Kern and Los Angeles Counties.

The proposed project is identified to access renewable energy resources in the Tehachapi Mountains and Mojave Desert areas and to improve reliability and upgrade transmission capacity. The Center for Biological Diversity (the "Center") strongly supports the development of renewable energy production, and the generation of electricity. We see the development of renewable energy as a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, and to assist California in meeting emission reductions through compliance with its Renewable Portfolio Standards. However, like any project, proposed transmission to capture far-flung renewable energy (and power projects) should be thoughtfully planned to minimize impacts to the environment. In particular, projects should avoid impacts to sensitive species and habitats, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and lines and the

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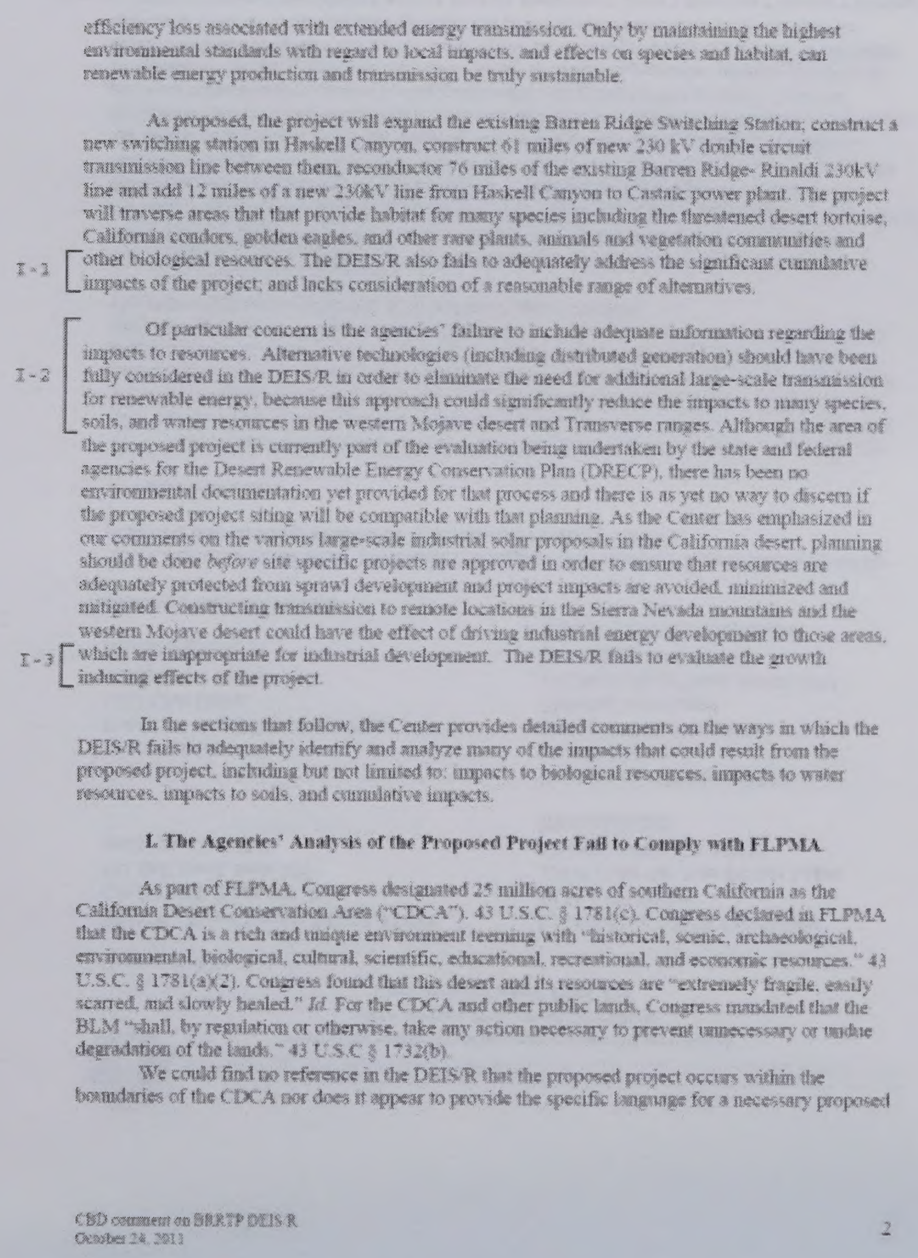


efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production and transmission be truly sustainable.

As proposed, the project will expand the existing Barren Ridge Switching Station; construct a new switching station in Haskell Canyon, construct 61 miles of new 230 kV double circuit transmission line between them, reconductor 76 miles of the existing Barren Ridge- Rinaldi 230kV line and add 12 miles of a new 230kV line from Haskell Canyon to Castaic power plant. The project will traverse areas that that provide habitat for many species including the threatened desert tortoise, California condors, golden eagles, and other rare plants, animals and vegetation communities and other biological resources. The DEIS/R also fails to adequately address the significant cumulative impacts of the project; and lacks consideration of a reasonable range of alternatives. I-1

I-2 Of particular concern is the agencies' failure to include adequate information regarding the impacts to resources. Alternative technologies (including distributed generation) should have been fully considered in the DEIS/R in order to eliminate the need for additional large-scale transmission for renewable energy, because this approach could significantly reduce the impacts to many species, soils, and water resources in the western Mojave desert and Transverse ranges. Although the area of the proposed project is currently part of the evaluation being undertaken by the state and federal agencies for the Desert Renewable Energy Conservation Plan (DRECP), there has been no environmental documentation yet provided for that process and there is as yet no way to discern if the proposed project siting will be compatible with that planning. As the Center has emphasized in our comments on the various large-scale industrial solar proposals in the California desert, planning should be done *before* site specific projects are approved in order to ensure that resources are adequately protected from sprawl development and project impacts are avoided, minimized and mitigated. Constructing transmission to remote locations in the Sierra Nevada mountains and the western Mojave desert could have the effect of driving industrial energy development to those areas, which are inappropriate for industrial development. The DEIS/R fails to evaluate the growth inducing effects of the project. I-3

In the sections that follow, the Center provides detailed comments on the ways in which the DEIS/R fails to adequately identify and analyze many of the impacts that could result from the proposed project, including but not limited to: impacts to biological resources, impacts to water resources, impacts to soils, and cumulative impacts.

I. The Agencies' Analysis of the Proposed Project Fail to Comply with FLPMA.

As part of FLPMA, Congress designated 25 million acres of southern California as the California Desert Conservation Area ("CDCA"). 43 U.S.C. § 1781(c). Congress declared in FLPMA that the CDCA is a rich and unique environment teeming with "historical, scenic, archaeological, environmental, biological, cultural, scientific, educational, recreational, and economic resources." 43 U.S.C. § 1781(a)(2). Congress found that this desert and its resources are "extremely fragile, easily scarred, and slowly healed." *Id.* For the CDCA and other public lands, Congress mandated that the BLM "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C § 1732(b).

We could find no reference in the DEIS/R that the proposed project occurs within the boundaries of the CDCA nor does it appear to provide the specific language for a necessary proposed

Response I-1: The cumulative impacts of the Project were described in Chapter 5 of the Draft EIS/EIR, including documentation of significant cumulative impacts. In the Draft EIS/EIR, significant cumulative effects are described for Agriculture on pages 5-32 through 5-34; for air quality and climate change on page 5-17; for biological resources on pages 5-67, 5-75, 5-93; for California condor on pages 5-88 through 5-90; for recreation on pages 5-73, 5-38, 5-39, 5-40, 5-41 and 5-42; and for visual resources on page 5-54 and 5-55.

The range of alternatives is adequate when considering the purpose of and need for the action. A lengthy alternatives evaluation process was conducted over the past three years, and is documented in detail in the Alternatives Development Report, Appendix B of the Draft and Final EIS/EIR. In May 2007, LADWP concluded a regional siting study to identify constraints and opportunities for siting the BRRTP. A subsequent process included public and agency scoping in the spring of 2008 to determine the range of alternatives; those that were eliminated from detailed consideration; alternatives that were evaluated in detail; and the no-action alternative. Further public input was received in early 2009 on the alternatives, including those that were proposed to be eliminated from consideration. The list of alternatives considered and eliminated on pages 2-13 through 2-30 of the Final EIS/EIR include energy conservation and load management, distributed generation, solar, accessing other renewable resource areas within the region, Direct Current (DC) transmission line, quad-circuit structures, other voltages besides 230 kV, underground construction, advanced conductor technologies, reconductoring with no new 230 kV line constructed, and no reconductoring. The total list of alternatives initially considered for the Proposed Action is a wide range, and is thus adequate for the environmental review and decision processes.

Response I-2: The impact analysis adequately addresses the context and intensity of the potential effects of all aspects and components of the BRRTP, including temporal and cumulative effects, for each of the alternatives. There is adequate information about resources provided for the decision-makers to sharply contrast the alternatives and to provide good documentation to the public of possible effects of each alternative's actions. Much detail is presented in the accompanying technical reports to the Final EIS/EIR in Volumes III and IV.

While distributed generation and in-basin generation expansion were determined to have the potential to avoid or minimize environmental effects, it was also determined that they would not meet the Project purpose and need, and as such, they were eliminated from detailed evaluation in the Draft EIS/EIR. Also refer to page 2-15 of the Final EIS/EIR and to the Alternatives Development Report (Appendix B to the Final EIS/EIR) for a full discussion of alternative technologies, including distributed generation and in-basin generation expansion. Also, refer to Response H-27.

Response I-3: Growth-inducing effects of the Project are described in Chapter 6, Section 6.5, on page 6-5 through 6-7 of the Final EIS/EIR. The Project would be considered growth-accommodating for the development of renewable resource generation in the Tehachapi Mountains and Mojave Desert areas because it is expected that renewable energy generation development would occur in the Tehachapi Mountains and Mojave Desert areas regardless of the construction of BRRTP. The Desert Renewable Energy Conservation Plan (DRECP) was under development at the time of the publication of the Final EIS/EIR. It was not feasible to delay environmental review for BRRTP until the completion of the DRECP because of LADWP's Renewable Portfolio Standard, which requires that 35% of LADWP's energy

I-4 amendment to the CDCA plan to allow the proposed alternative. Additionally relying upon the 2009 West-Wide Energy Corridor Programmatic Environmental Impact Statement (PEIS) for the proposed transmission line corridor is problematic, because that PEIS is currently being litigated.

While the Center supports additional protections for species and habitats on public land that could accrue (for example by adoption the no action alternative which would not allow transmission development along the proposed route), we have several concerns about the land use designation and impacts to species. For example, most of the BLM-managed lands proposed for development are MUC class L lands. Under the CDCA Plan, Multiple-use Class L (Limited Use) "protects sensitive, natural, scenic, ecological, and cultural resources values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished." CDCA Plan at 13.

I-5 The Center has repeatedly sought stronger protections for desert tortoise and tortoise critical habitat both in the Desert Wildlife Management Areas (DWMAs) and in other areas within the CDCA as a whole and particularly within the West Mojave (WEMO) planning area. Despite the fact that desert tortoise populations in the WEMO DWMAs continue to decline, BLM has continued to allow activities that significantly impact tortoise and areas of occupied habitat outside of the DWMAs. As detailed below, the proposed project could significantly impact occupied desert tortoise habitat outside of DWMA and alternatives should have been considered to relocate all of the project elements to minimize these impacts but no such alternatives were adequately explored.

I-6 The agencies have failed to take a comprehensive look at the proposed plan amendment for the ROW to determine: 1) whether industrial scale projects are appropriate for any of the public lands in this area; 2) if so, how much of the public lands are suitable for such industrial uses given the need to balance other management goals including preservation of habitat and water resources; and 3) the location of the public lands suitable for such uses. I-7 The Center remains concerned that the result of the current process is a piecemeal approach to project review with site-specific approvals made before planning is completed which threatens to undermine the "bioregional" approach in the CDCA Plan as a whole as well as violate the fundamental planning principles of FLPMA.

A. The DEIS/R Fails to Adequately Address the Plan Amendment in the Context of the CDCA Plan.

I-8 Unfortunately, the DEIS/R fails to consider the impacts of the proposed project as a plan amendment and reasonable alternatives in the context of FLPMA and the CDCA Plan. FLPMA requires that in developing and revising land use plans, the BLM consider many factors and "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences . . . consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values." 43 U.S.C. § 1712(c). As stated clearly in the CDCA Plan:

> The goal of the Plan is to provide for the use of the public lands, and resources of the California Desert Conservation Area, including economic, educational, scientific, and recreational uses, in a manner which enhances wherever possible—and which does not diminish, on balance—the environmental, cultural, and aesthetic values of the Desert and its productivity.

be renewable by 2020 (see Section 1.2.2 of Chapter 1 of the Final EIS/EIR). Please refer to Appendix D, Regulatory Setting, of the Final EIS/EIR for new information on the DRECP.

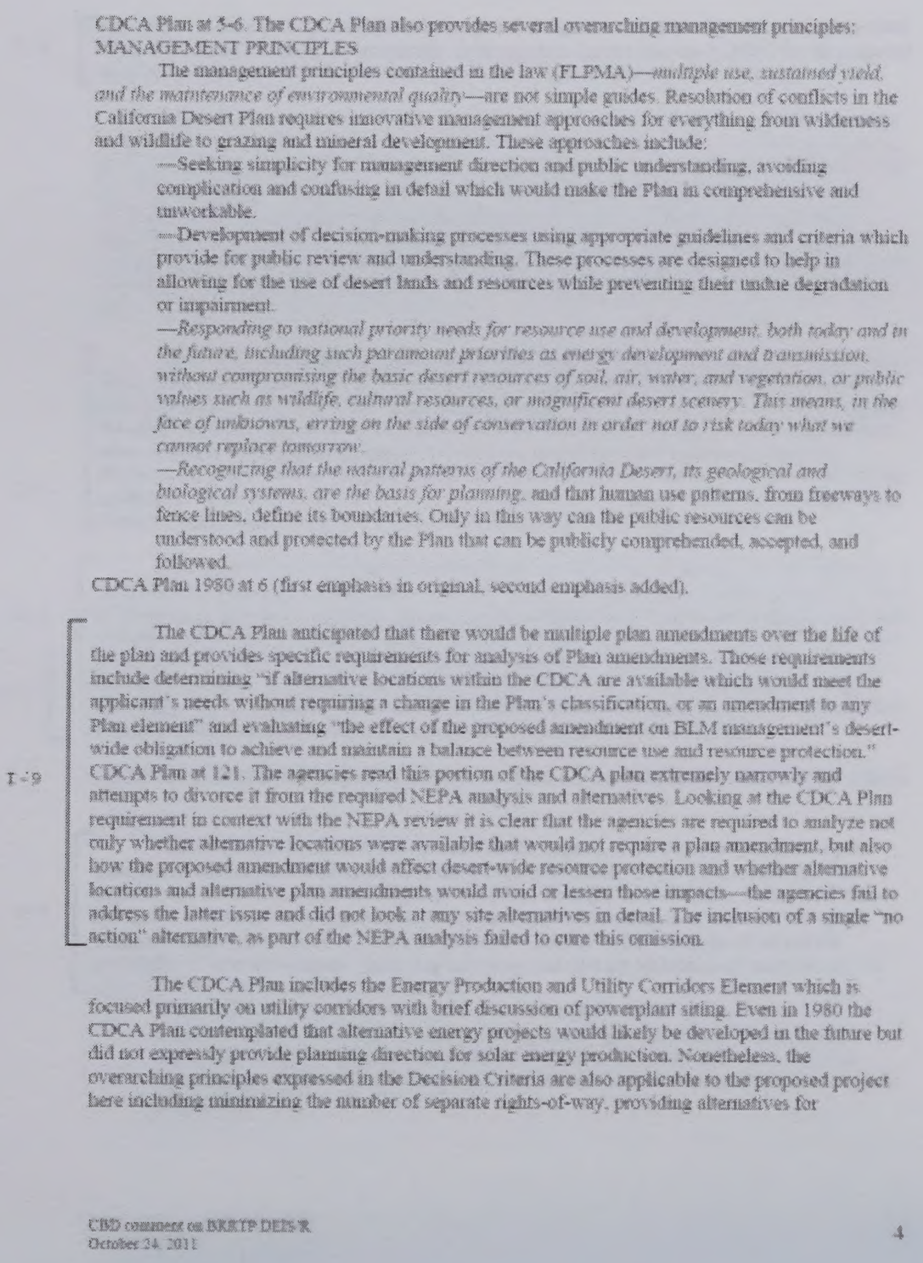
Response I-4: The Records of Decision for the West Wide Corridor Programmatic Environmental Impact Statement (PEIS) were signed and published in the Federal Register in January 2009. Although this PEIS is currently under litigation, unless the court rules that the PEIS must be changed, it is still applicable to this Project. A new ROW on land under the management of the BLM would be within an existing designated utility corridor, Corridor A of the 16 designated utility corridors of the California Desert Conservation Area (CDCA) Plan (as Amended). It would also be within the West-Wide Energy Corridor 23-106 as designated in the West Wide Energy Corridor Final PEIS (2008). A new transmission line in the designated corridor is compliant with the CDCA Plan, and as such does not require a plan amendment. Reconductoring and the new 230 kV circuit would both be within existing ROWs on BLM-managed lands and would also not require an amendment to the CDCA Plan. No alternative would require an amendment to the CDCA Plan.

Response I-5: Occupied desert tortoise habitat within or outside of Desert Wildlife Management Areas (DWMAs) is not expected to be significantly impacted. Impacts to the desert tortoise and its habitat are analyzed in Section 4.3.1 of the Final EIS/EIR. The Draft and Final EIS/EIR conclude that, with the implementation of the recommended General Practices and mitigation measures, direct and indirect Project-specific impacts to desert tortoise and its habitat would be reduced to less than significant levels. As described in Chapter 2 of the Final EIS/EIR and the Alternatives Development Report, included as Appendix B to the Final EIS/EIR, a reasonable range of alternatives to the Proposed Action was considered.

Response I-6: A new ROW on land under the management of the BLM would be within an existing designated utility corridor, Corridor A of the 16 designated utility corridors of the CDCA Plan (as Amended). It would also be within the West-Wide Energy Corridor 23-106 as designated in the West Wide Energy Corridor Final PEIS (2008). A new transmission line in the designated corridor is compliant with the CDCA Plan, and as such does not require a plan amendment. For National Forest System (NFS) lands, the Federal Agency Preferred Alternative occurs within the same West-Wide Energy Corridor as on BLM lands, and is also within a utility corridor designated in the 2005 Land Management Plan (LMP) for the four Southern California National Forests. Both of these designations identify NFS lands as suitable and appropriate for electrical transmission lines.

Response I-7: The Project, if approved, would be consistent with the CDCA Plan and no plan amendment would be required as described in Response I-6 above. As such, no site-specific approvals would be made before the CDCA planning process is complete.

Response I-8: No plan amendment to the CDCA Plan would be required for the proposed Project. The new ROW on land under the management of the BLM would be within an existing designated utility corridor, Corridor A of the 16 designated utility corridors of the CDCA Plan (as Amended). It would also be within the West-Wide Energy Corridor 23-106 as designated in the West Wide Energy Corridor Final PEIS (2008). A new transmission line in the designated corridor, if approved, would be compliant with the CDCA Plan, and as such would not require a plan amendment.



CDCA Plan at 5-6. The CDCA Plan also provides several overarching management principles:
MANAGEMENT PRINCIPLES

> The management principles contained in the law (FLPMA)—*multiple use, sustained yield, and the maintenance of environmental quality*—are not simple guides. Resolution of conflicts in the California Desert Plan requires innovative management approaches for everything from wilderness and wildlife to grazing and mineral development. These approaches include:
>
> —Seeking simplicity for management direction and public understanding, avoiding complication and confusing in detail which would make the Plan in comprehensive and unworkable.
>
> —Development of decision-making processes using appropriate guidelines and criteria which provide for public review and understanding. These processes are designed to help in allowing for the use of desert lands and resources while preventing their undue degradation or impairment.
>
> —*Responding to national priority needs for resource use and development, both today and in the future, including such paramount priorities as energy development and transmission, without compromising the basic desert resources of soil, air, water, and vegetation, or public values such as wildlife, cultural resources, or magnificent desert scenery. This means, in the face of unknowns, erring on the side of conservation in order not to risk today what we cannot replace tomorrow.*
>
> —*Recognizing that the natural patterns of the California Desert, its geological and biological systems, are the basis for planning,* and that human use patterns, from freeways to fence lines, define its boundaries. Only in this way can the public resources can be understood and protected by the Plan that can be publicly comprehended, accepted, and followed.

CDCA Plan 1980 at 6 (first emphasis in original, second emphasis added).

I-9 The CDCA Plan anticipated that there would be multiple plan amendments over the life of the plan and provides specific requirements for analysis of Plan amendments. Those requirements include determining "if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element" and evaluating "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection." CDCA Plan at 121. The agencies read this portion of the CDCA plan extremely narrowly and attempts to divorce it from the required NEPA analysis and alternatives. Looking at the CDCA Plan requirement in context with the NEPA review it is clear that the agencies are required to analyze not only whether alternative locations were available that would not require a plan amendment, but also how the proposed amendment would affect desert-wide resource protection and whether alternative locations and alternative plan amendments would avoid or lessen those impacts—the agencies fail to address the latter issue and did not look at any site alternatives in detail. The inclusion of a single "no action" alternative, as part of the NEPA analysis failed to cure this omission.

The CDCA Plan includes the Energy Production and Utility Corridors Element which is focused primarily on utility corridors with brief discussion of powerplant siting. Even in 1980 the CDCA Plan contemplated that alternative energy projects would likely be developed in the future but did not expressly provide planning direction for solar energy production. Nonetheless, the overarching principles expressed in the Decision Criteria are also applicable to the proposed project here including minimizing the number of separate rights-of-way, providing alternatives for

For the implementation of the Project on BLM-managed public lands within the CDCA Plan area, BLM would need to take the following actions:

1. Grant 3.7 miles of new 200-foot-wide ROW adjacent to existing transmission lines for the new 230 kV double-circuit transmission line;
2. Authorize 3.8 miles of reconductoring of the existing Barren Ridge-Rinaldi transmission line on existing ROW on BLM-managed lands (BLM Right-of-Way Grant LA-088876 as authorized by Congress in the Act of October 10, 1949); and
3. Authorize 275 feet of new 230 kV circuit on existing double-circuit structures on existing ROW on BLM-managed lands (BLM Right-of-Way Grant RI-2822).

For the authorization of the reconductoring of the existing 230 kV line, the Project would be within existing ROW authorized by Congress, and no plan amendment to the CDCA Plan would be required. Likewise, for the authorization of 275 feet of new circuit, the Project would be within an existing ROW on BLM-managed public lands and would not require a plan amendment.

Response I-9: As described in Responses I-6 through I-8 above, the Project would be consistent with the CDCA Plan, and no plan amendment would be required; therefore, there is no need to consider CDCA Plan requirements regarding this issue.

consideration during the processing of applications, and "avoid[ing] sensitive resources wherever

I-10 possible." CDCA Plan at 93. Nothing in the DEIS/R shows that the agencies considered the landscape level issues and management objectives or alternatives to the proposed plan amendment *in the DEIS/R.*

I-11 In addition, the agencies should have considered the impacts to existing land use plans for these public lands across several scales including, for example: in the Antelope valley, in the Western Mojave Desert in California; and in the CDCA as a whole.

B. Fails to Adequately Address Other Ongoing Planning Efforts

I-12 As noted above, the DEIS/R fails to adequately address the proposed project in the context of other connected projects (including multiple renewable energy projects, substations and additional transmission lines) and the ongoing PEIS planning process for solar development in six western states undertaken by BLM and DOE, where a supplemental draft plan[1] is tentatively slated to be released by year's end. Without prior planning and analysis being completed, there is a high risk that the direct, indirect and cumulative impacts of the proposed project in conjunction with others may lead to sprawl development in the area and undermine the planning for renewable energy industrial zones that BLM has undertaken.

C. The Agencies Failed to Inventory the Resources of these Public Lands Before Making a Decision to Allow Destruction of those Resources

FLPMA states that "[t]he Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values," and this "[t]his inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. § 1711(a). FLPMA also requires that this inventory form the basis of the land use planning process. 43 U.S.C. § 1701(a)(2). *See Center for Biological Diversity v. Bureau of Land Management*, 422 F.Supp.2d 1115, 1166-67 (N.D. Cal. 2006) (discussing need for BLM to take into account known resources in making management decisions); *ONDA v. Rasmussen*, 451 F.Supp. 2d 1202, 1212-13 (D. Or. 2006) (finding that BLM did not take a hard look under NEPA by relying on outdated inventories and such reliance was inconsistent with BLM's statutory obligations to engage in a continuing inventory under FLPMA). It is clear that the agencies should not approve a project based on outdated and inadequate inventories of affected resources on public lands.

I-13 As detailed below in the NEPA sections, here the agencies have failed to compile an adequate inventory of the resources of the public lands that could be affected by the proposed project *before* preparing the DEIS/R (including, e.g., desert tortoise densities, California condors, golden eagle surveys, and other biological resources) which is necessary in order to adequately assess the impacts to resources of these public lands in light of the proposed plan amendment and the agencies have also failed to adequately analyze impacts on known resources.

I-14 Therefore, it appears that a revised DEIS/R or supplemental DEIS/R must be prepared to include several categories of new information including new survey data about the resources of the site and potential impacts of the project on resources of our public land and water, and that document must be circulated for public review and comment.

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[1] http://solareis.anl.gov/documents/maps/studyareas/Solar_Study_Area_CA_Ln_7-09.pdf

Response I-10: As described in Responses I-6 through I-9 above, the Project would be consistent with the CDCA Plan, and no plan amendment would be required to approve the Project.

Response I-11: The CDCA Plan and West Mojave Plan as they relate to land use are addressed in Appendix D of the Final EIS/EIR under Regulatory Setting. Designated utility corridors as they relate to BLM public land for the Project are presented in Table D-9. Land use plan designations crossed by the Proposed Action and Alternatives are also provided in Appendix F of the Final EIS/EIR, Data Tables.

As discussed in Chapter 4 of the Final EIS/EIR, Environmental Impacts, new gas, electric, and water transmission facilities, and cables for interstate communication may be allowed only within designated corridors. The Proposed Action (Alternative 2) transmission line would utilize a BLM-designated utility corridor (Corridor A). This utility corridor is also a 368 energy corridor (multi-modal corridor 23-106).

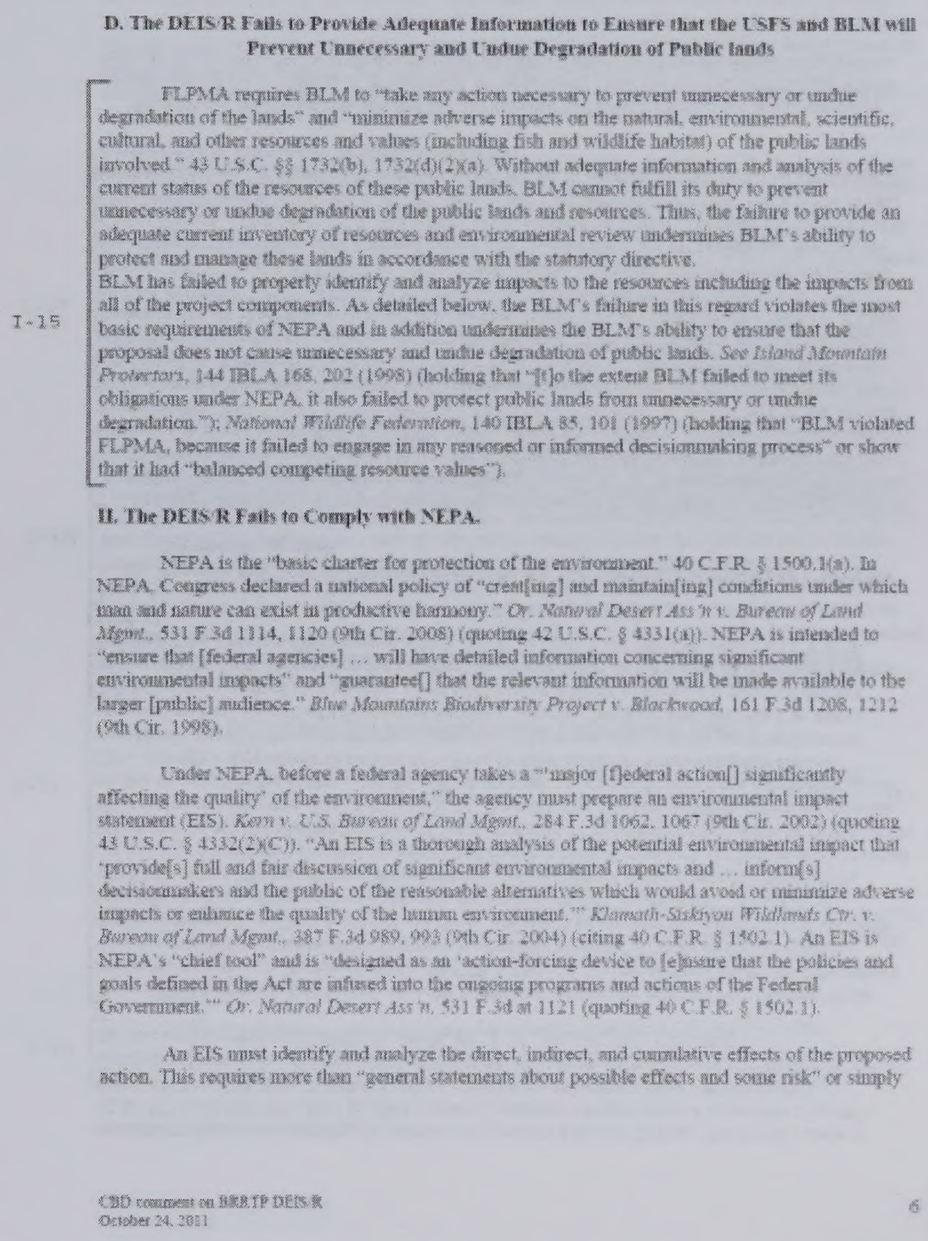
BLM's 2009 *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States* set forth the decision of the Department of the Interior Assistant Secretary, Land and Minerals Management (ASLM), to approve a number of proposed plan amendments. This ROD amended a number of BLM land use plans, which included the CDCA Plan, Ridgecrest Field Office, resulting in the designation of multi-modal corridor 23-106 as an energy corridor.

Response I-12: While the proposed Project is not directly connected to any other projects, including any specific renewable energy projects, substations, or additional transmission lines, the Draft and Final EIS/EIR does adequately addresses the proposed

Project in the context of other projects and planning processes. The direct and indirect impacts of the proposed Project are fully described in Chapter 4, Environmental Impacts, of the Final EIS/EIR. The cumulative effects of the proposed Project in conjunction with other past, present, and reasonably foreseeable projects are fully described in Chapter 5, Cumulative Effects, of the Final EIS/EIR.

The Final EIS/EIR also discusses other planning efforts in the Project area (including the DRECP and BLM's Solar Programmatic Environmental Impact Statement). Please refer to Appendix D, Regulatory Setting, of the Final EIS/EIR for new information on the DRECP and BLM's Solar Programmatic Environmental Impact Statement. While the BRRTP environmental review process and other planning processes may be occurring within a similar time frame, there is no evidence that the BRRTP would lead to sprawl development or undermine any concurrent or future planning efforts.

Response I-13: As described in Response I-8 above, the Project would be consistent with the CDCA Plan, and no plan amendment is required. Preparation of the Draft EIS/EIR included investigations and disclosure of environmental information (see CEQA Guidelines § 15144) and used available resources and public databases, as well as aerial photo interpretation and field investigations, to determine the baseline information and develop the environmental setting. Chapter 4 of the Draft and Final EIS/EIR in its entirety describes the analysis of impacts on known resources. The EIS/EIR also contains detailed technical documents and appendices in Volumes II through V. The data and inventory are adequate to understand the impacts associated with the Proposed Action and Alternatives, as well as to sharply contrast the differences between alternatives.



D. The DEIS/R Fails to Provide Adequate Information to Ensure that the USFS and BLM will Prevent Unnecessary and Undue Degradation of Public lands

FLPMA requires BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" and "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §§ 1732(b), 1732(d)(2)(a). Without adequate information and analysis of the current status of the resources of these public lands, BLM cannot fulfill its duty to prevent unnecessary or undue degradation of the public lands and resources. Thus, the failure to provide an adequate current inventory of resources and environmental review undermines BLM's ability to protect and manage these lands in accordance with the statutory directive.

I-15 BLM has failed to properly identify and analyze impacts to the resources including the impacts from all of the project components. As detailed below, the BLM's failure in this regard violates the most basic requirements of NEPA and in addition undermines the BLM's ability to ensure that the proposal does not cause unnecessary and undue degradation of public lands. *See Island Mountain Protectors*, 144 IBLA 168, 202 (1998) (holding that "[t]o the extent BLM failed to meet its obligations under NEPA, it also failed to protect public lands from unnecessary or undue degradation."); *National Wildlife Federation*, 140 IBLA 85, 101 (1997) (holding that "BLM violated FLPMA, because it failed to engage in any reasoned or informed decisionmaking process" or show that it had "balanced competing resource values").

II. The DEIS/R Fails to Comply with NEPA.

NEPA is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1(a). In NEPA, Congress declared a national policy of "creat[ing] and maintain[ing] conditions under which man and nature can exist in productive harmony." *Or. Natural Desert Ass'n v. Bureau of Land Mgmt.*, 531 F.3d 1114, 1120 (9th Cir. 2008) (quoting 42 U.S.C. § 4331(a)). NEPA is intended to "ensure that [federal agencies] … will have detailed information concerning significant environmental impacts" and "guarantee[] that the relevant information will be made available to the larger [public] audience." *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998).

Under NEPA, before a federal agency takes a "'major [f]ederal action[] significantly affecting the quality' of the environment," the agency must prepare an environmental impact statement (EIS). *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1067 (9th Cir. 2002) (quoting 43 U.S.C. § 4332(2)(C)). "An EIS is a thorough analysis of the potential environmental impact that 'provide[s] full and fair discussion of significant environmental impacts and … inform[s] decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.'" *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993 (9th Cir. 2004) (citing 40 C.F.R. § 1502.1). An EIS is NEPA's "chief tool" and is "designed as an 'action-forcing device to [e]nsure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government.'" *Or. Natural Desert Ass'n*, 531 F.3d at 1121 (quoting 40 C.F.R. § 1502.1).

An EIS must identify and analyze the direct, indirect, and cumulative effects of the proposed action. This requires more than "general statements about possible effects and some risk" or simply

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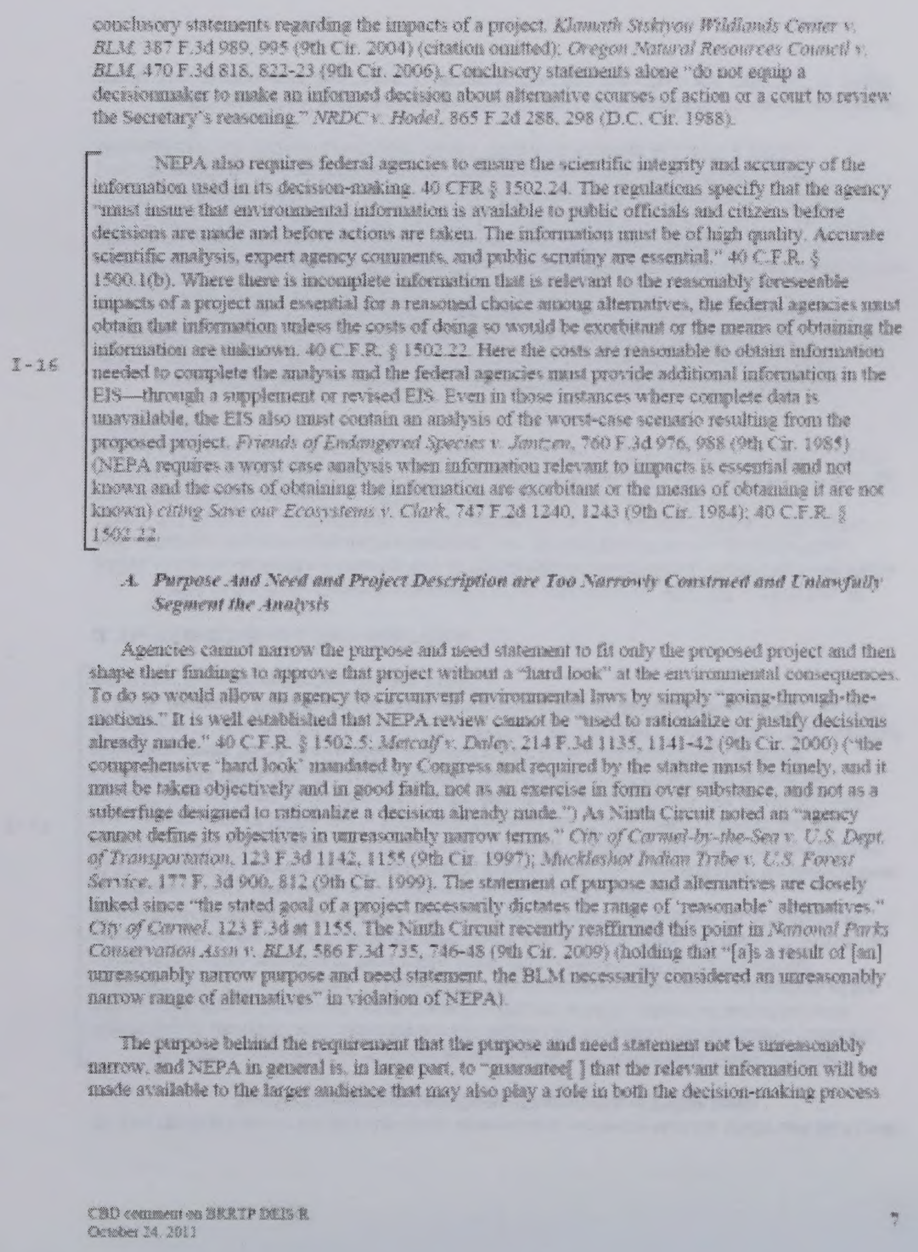
For example, the evaluation of biological resources included a review of applicable documents and identification, and characterization of biological resources during three years of survey work. Baseline data was also gathered by reviewing information obtained from the USFWS Critical Habitat Portal (USFWS 2011), the USFWS BRRTP special-status species list, CDFG BRRTP special-status species list, the National Wetland Inventory (NWI 2011), California GAP Analysis Program (USGS 2011), literature searches, reports from surrounding projects, examinations of aerial photographs, and database searches. Database searches included queries of the Electronic Inventory of Rare and Endangered Plants of California (CNPS 2011) and California Natural Diversity Data Base (CNDDB) (CDFG 2011). Regional resource planning documents prepared by federal, State, and local agencies were also reviewed. Baseline information for all species assessed prior to the Draft EIS/EIR is included in the Biological Technical Report and its appendices, located in Volume IV of the Final EIS/EIR.

Response I-14: The comment does not mention any specific resource or issue for which the information used in compiling the EIR/EIS is inadequate. An adequate inventory of the resources in the study areas along each alternative was provided in the Draft EIS/EIR in Chapter 3 and the accompanying technical reports and appendices (Volumes II through V). The potential impacts of the Proposed Action and Alternatives on public land and water resources were reasonably and adequately provided in the Draft EIS/EIR in Chapter 4 and the accompanying technical reports and appendices (Volumes II through V). Chapters 3 and 4 of the Draft and Final EIS/EIR together summarize the existing setting and analysis of impacts on known resources and to the issues identified during the scoping process (also refer to Chapter 7 of the Final EIS/EIR). As such, a revised or supplemental Draft EIS/EIR is not



conclusory statements regarding the impacts of a project. *Klamath Siskiyou Wildlands Center v. BLM*, 387 F.3d 989, 995 (9th Cir. 2004) (citation omitted); *Oregon Natural Resources Council v. BLM*, 470 F.3d 818, 822-23 (9th Cir. 2006). Conclusory statements alone "do not equip a decisionmaker to make an informed decision about alternative courses of action or a court to review the Secretary's reasoning." *NRDC v. Hodel*, 865 F.2d 288, 298 (D.C. Cir. 1988).

I-16 NEPA also requires federal agencies to ensure the scientific integrity and accuracy of the information used in its decision-making. 40 CFR § 1502.24. The regulations specify that the agency "must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential." 40 C.F.R. § 1500.1(b). Where there is incomplete information that is relevant to the reasonably foreseeable impacts of a project and essential for a reasoned choice among alternatives, the federal agencies must obtain that information unless the costs of doing so would be exorbitant or the means of obtaining the information are unknown. 40 C.F.R. § 1502.22. Here the costs are reasonable to obtain information needed to complete the analysis and the federal agencies must provide additional information in the EIS—through a supplement or revised EIS. Even in those instances where complete data is unavailable, the EIS also must contain an analysis of the worst-case scenario resulting from the proposed project. *Friends of Endangered Species v. Jantzen*, 760 F.3d 976, 988 (9th Cir. 1985) (NEPA requires a worst case analysis when information relevant to impacts is essential and not known and the costs of obtaining the information are exorbitant or the means of obtaining it are not known) *citing Save our Ecosystems v. Clark*, 747 F.2d 1240, 1243 (9th Cir. 1984); 40 C.F.R. § 1502.22.

A. Purpose And Need and Project Description are Too Narrowly Construed and Unlawfully Segment the Analysis

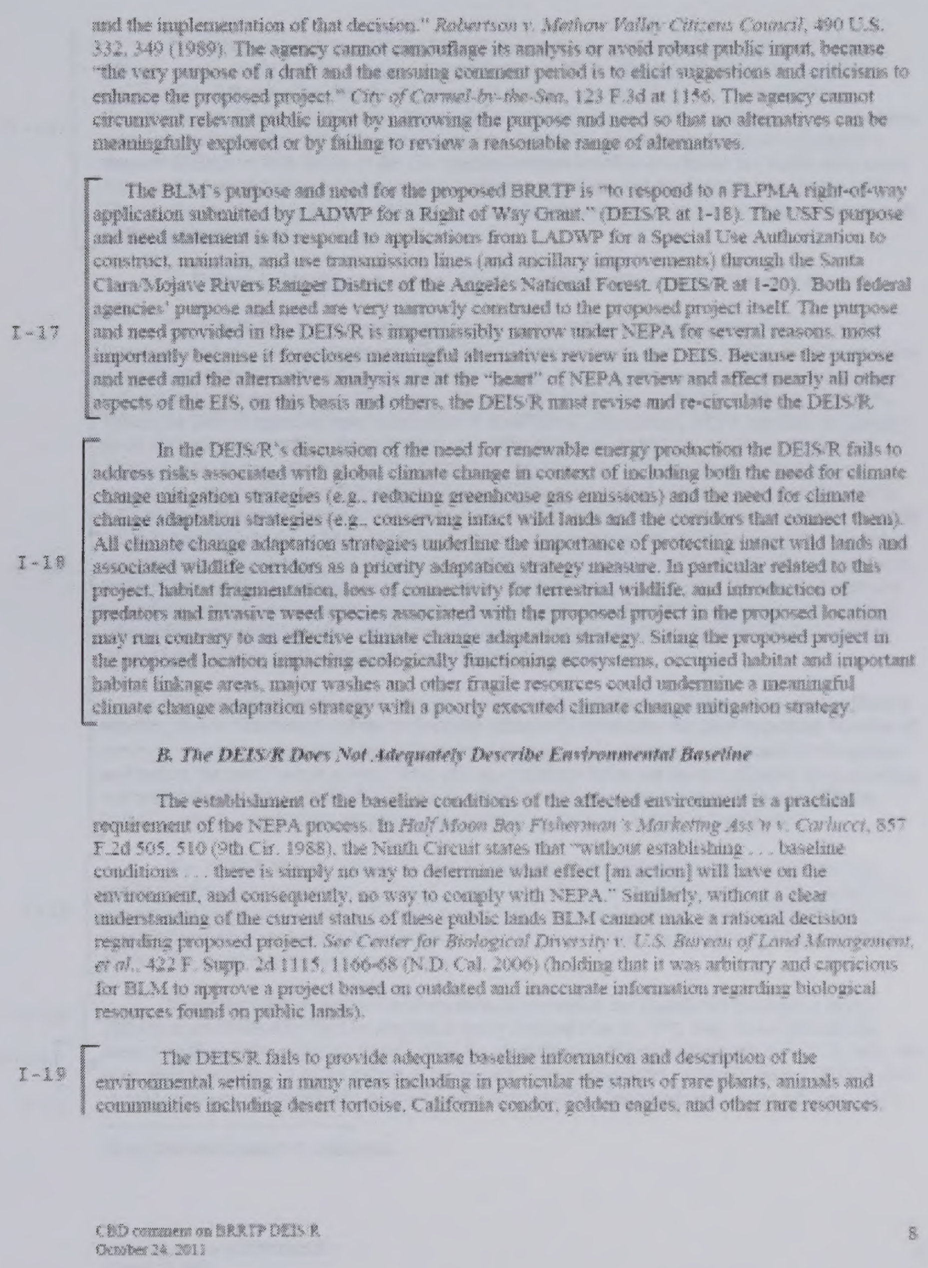
Agencies cannot narrow the purpose and need statement to fit only the proposed project and then shape their findings to approve that project without a "hard look" at the environmental consequences. To do so would allow an agency to circumvent environmental laws by simply "going-through-the-motions." It is well established that NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; *Metcalf v. Daley*, 214 F.3d 1135, 1141-42 (9th Cir. 2000) ("the comprehensive 'hard look' mandated by Congress and required by the statute must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.") As Ninth Circuit noted an "agency cannot define its objectives in unreasonably narrow terms." *City of Carmel-by-the-Sea v. U.S. Dept. of Transportation*, 123 F.3d 1142, 1155 (9th Cir. 1997); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F. 3d 900, 812 (9th Cir. 1999). The statement of purpose and alternatives are closely linked since "the stated goal of a project necessarily dictates the range of 'reasonable' alternatives." *City of Carmel*, 123 F.3d at 1155. The Ninth Circuit recently reaffirmed this point in *National Parks Conservation Ass'n v. BLM*, 586 F.3d 735, 746-48 (9th Cir. 2009) (holding that "[a]s a result of [an] unreasonably narrow purpose and need statement, the BLM necessarily considered an unreasonably narrow range of alternatives" in violation of NEPA).

The purpose behind the requirement that the purpose and need statement not be unreasonably narrow, and NEPA in general is, in large part, to "guarantee[ ] that the relevant information will be made available to the larger audience that may also play a role in both the decision-making process

required to distinguish between alternatives or provide reasonable data and analysis for the alternatives.

Response I-15: The comment does not mention any specific resource or issue for which the information used in compiling the EIR/EIS is inadequate. Refer to Response I-13. Adequate information and analysis of the current status of the resources of these public lands was included in the Draft EIS/EIR to allow BLM to fulfill its duty to prevent unnecessary or undue degradation of the public lands and resources. Additionally, impacts to the resources, including the impacts from all of the Project components, were properly identified, documented, analyzed, and disclosed. Chapters 3 and 4 of the Draft and Final EIS/EIR, in their entirety, describe the existing setting and analysis of impacts on known resources within the Project area.

Response I-16: This comment does not cite any specific inadequacies in the Draft EIS/EIR requiring a response. The Draft EIS/EIR provides adequate information relevant to the reasonably foreseeable impacts of the proposed Project. Scoping helped identify the issues and concerns that became the focus of the alternatives and the analysis in the document. Chapters 3, 4, and 5 of the Draft and Final EIS/EIR, in their entirety, as well as the detailed information in the backup documents and technical reports (Volumes II through V of the Final EIS/EIR) describe the existing setting and analysis of impacts on known resources. Where appropriate, worst-case analyses were performed by using conservative assumptions and assuming presence of resources.



and the implementation of that decision." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The agency cannot camouflage its analysis or avoid robust public input, because "the very purpose of a draft and the ensuing comment period is to elicit suggestions and criticisms to enhance the proposed project." *City of Carmel-by-the-Sea*, 123 F.3d at 1156. The agency cannot circumvent relevant public input by narrowing the purpose and need so that no alternatives can be meaningfully explored or by failing to review a reasonable range of alternatives.

I-17 The BLM's purpose and need for the proposed BRRTP is "to respond to a FLPMA right-of-way application submitted by LADWP for a Right of Way Grant." (DEIS/R at 1-18). The USFS purpose and need statement is to respond to applications from LADWP for a Special Use Authorization to construct, maintain, and use transmission lines (and ancillary improvements) through the Santa Clara/Mojave Rivers Ranger District of the Angeles National Forest. (DEIS/R at 1-20). Both federal agencies' purpose and need are very narrowly construed to the proposed project itself. The purpose and need provided in the DEIS/R is impermissibly narrow under NEPA for several reasons, most importantly because it forecloses meaningful alternatives review in the DEIS. Because the purpose and need and the alternatives analysis are at the "heart" of NEPA review and affect nearly all other aspects of the EIS, on this basis and others, the DEIS/R must revise and re-circulate the DEIS/R.

I-18 In the DEIS/R's discussion of the need for renewable energy production the DEIS/R fails to address risks associated with global climate change in context of including both the need for climate change mitigation strategies (e.g., reducing greenhouse gas emissions) and the need for climate change adaptation strategies (e.g., conserving intact wild lands and the corridors that connect them). All climate change adaptation strategies underline the importance of protecting intact wild lands and associated wildlife corridors as a priority adaptation strategy measure. In particular related to this project, habitat fragmentation, loss of connectivity for terrestrial wildlife, and introduction of predators and invasive weed species associated with the proposed project in the proposed location may run contrary to an effective climate change adaptation strategy. Siting the proposed project in the proposed location impacting ecologically functioning ecosystems, occupied habitat and important habitat linkage areas, major washes and other fragile resources could undermine a meaningful climate change adaptation strategy with a poorly executed climate change mitigation strategy.

B. The DEIS/R Does Not Adequately Describe Environmental Baseline

The establishment of the baseline conditions of the affected environment is a practical requirement of the NEPA process. In *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." Similarly, without a clear understanding of the current status of these public lands BLM cannot make a rational decision regarding proposed project. *See Center for Biological Diversity v. U.S. Bureau of Land Management, et al.*, 422 F. Supp. 2d 1115, 1166-68 (N.D. Cal. 2006) (holding that it was arbitrary and capricious for BLM to approve a project based on outdated and inaccurate information regarding biological resources found on public lands).

I-19 The DEIS/R fails to provide adequate baseline information and description of the environmental setting in many areas including in particular the status of rare plants, animals and communities including desert tortoise, California condor, golden eagles, and other rare resources.

Response I-17: The Council on Environmental Quality (CEQ) regulations that implement NEPA require the EIS to "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 C.F.R. § 1502.13). The purpose and need for the BLM is outlined in Section 1.3.1 of the Final EIS/EIR, and the USFS purpose and need is outlined in Section 1.3.2 of the Final EIS/EIR. Both agencies are responding to an application for occupancy and use of federal lands under the authority of the Federal Land Policy and Management Act. Both agencies further describe the purpose and need by referencing agency policy and other statutory direction. The purpose and need is appropriately drafted within the agencies' authorities.

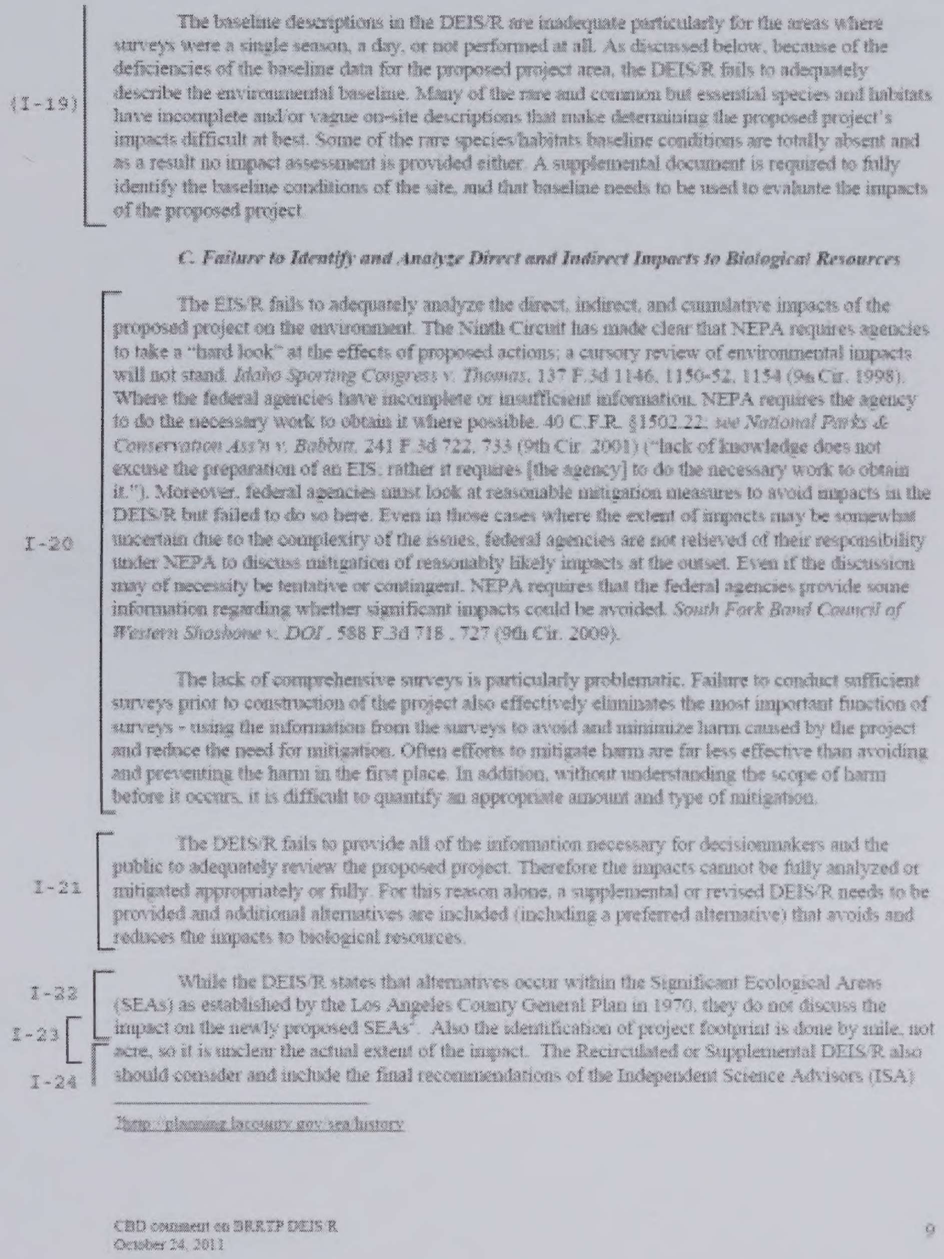
Based on the Project's purpose and need, the agencies considered a wide range of alternatives as summarized in Section 2.1.1 of the Final EIS/EIR and described in greater detail in Appendix B of the Final EIS/EIR. In addition to the no action alternative, four action alternatives (Alternatives 1, 2, 2a, and 3) were brought forward for detailed consideration. The purpose and need helped the agencies define alternatives that may accomplish the Project goals, as well as provided a reasoned basis to dismiss other options from detailed consideration, either as infeasible or not within the purpose and need.

Because the purpose and need and the alternatives analysis are adequately addressed in the Draft EIS/EIR, there is no reason to revise and re-circulate the Draft EIS/EIR.

Response I-18: Renewable energy projects must be described in context of strategies and policies, and this was done in the purpose and need documented in the Draft EIS/EIR on pages 1-4 to 1-8. This Project is an action taken by agencies to respond to the policies and strategies established by policy makers that the comment suggests be the focus of this environmental review. The agencies accept the policies and strategies, and believe this Project has adequately reviewed the purpose and need for the action in the proper context. Renewable projects must minimize impacts on private and public lands and resources to the extent possible, which also is the goal of this environmental review process, so we therefore have incorporated the adaptation strategies into the environmental review process. Alternatives have been evaluated and compared, functioning habitats would be preserved if an action alternative is selected, and corridors and disturbed areas would be utilized through existing corridors and access roads.

Response I-19: The baseline data and environmental analysis adequately identify and disclose impacts of the Proposed Action and Alternatives. Preparation of the Draft EIS/EIR included investigations and disclosure of environmental information (see CEQA Guidelines § 15144) and used available resources and public databases, as well as aerial photo interpretation and field investigations, to determine the baseline information and develop the environmental setting.

As described in I-13 above, the evaluation of biological resources included a review of applicable documents, and identification and characterization of biological resources during three years of survey work. Baseline data was also gathered by reviewing information obtained from the USFWS Critical Habitat Portal (USFWS 2011), the USFWS BRRTP special-status species list, CDFG BRRTP special-status species list, the National Wetland Inventory (NWI 2011), California GAP Analysis Program (USGS 2011), literature searches, reports from surrounding projects, examinations of aerial photographs, and database searches. Database searches included queries of the Electronic Inventory of Rare and Endangered Plants of California (CNPS 2011) and CNDDB (CDFG 2011). Regional resource planning documents



(I-19) The baseline descriptions in the DEIS/R are inadequate particularly for the areas where surveys were a single season, a day, or not performed at all. As discussed below, because of the deficiencies of the baseline data for the proposed project area, the DEIS/R fails to adequately describe the environmental baseline. Many of the rare and common but essential species and habitats have incomplete and/or vague on-site descriptions that make determining the proposed project's impacts difficult at best. Some of the rare species/habitats baseline conditions are totally absent and as a result no impact assessment is provided either. A supplemental document is required to fully identify the baseline conditions of the site, and that baseline needs to be used to evaluate the impacts of the proposed project.

C. Failure to Identify and Analyze Direct and Indirect Impacts to Biological Resources

I-20 The EIS/R fails to adequately analyze the direct, indirect, and cumulative impacts of the proposed project on the environment. The Ninth Circuit has made clear that NEPA requires agencies to take a "hard look" at the effects of proposed actions; a cursory review of environmental impacts will not stand. *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150-52, 1154 (9th Cir. 1998). Where the federal agencies have incomplete or insufficient information, NEPA requires the agency to do the necessary work to obtain it where possible. 40 C.F.R. §1502.22; *see National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001) ("lack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it."). Moreover, federal agencies must look at reasonable mitigation measures to avoid impacts in the DEIS/R but failed to do so here. Even in those cases where the extent of impacts may be somewhat uncertain due to the complexity of the issues, federal agencies are not relieved of their responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset. Even if the discussion may of necessity be tentative or contingent. NEPA requires that the federal agencies provide some information regarding whether significant impacts could be avoided. *South Fork Band Council of Western Shoshone v. DOI*, 588 F.3d 718 , 727 (9th Cir. 2009).

The lack of comprehensive surveys is particularly problematic. Failure to conduct sufficient surveys prior to construction of the project also effectively eliminates the most important function of surveys - using the information from the surveys to avoid and minimize harm caused by the project and reduce the need for mitigation. Often efforts to mitigate harm are far less effective than avoiding and preventing the harm in the first place. In addition, without understanding the scope of harm before it occurs, it is difficult to quantify an appropriate amount and type of mitigation.

I-21 The DEIS/R fails to provide all of the information necessary for decisionmakers and the public to adequately review the proposed project. Therefore the impacts cannot be fully analyzed or mitigated appropriately or fully. For this reason alone, a supplemental or revised DEIS/R needs to be provided and additional alternatives are included (including a preferred alternative) that avoids and reduces the impacts to biological resources.

I-22 While the DEIS/R states that alternatives occur within the Significant Ecological Areas
(SEAs) as established by the Los Angeles County General Plan in 1970, they do not discuss the
I-23 impact on the newly proposed SEAs[2]. Also the identification of project footprint is done by mile, not
acre, so it is unclear the actual extent of the impact. The Recirculated or Supplemental DEIS/R also
I-24 should consider and include the final recommendations of the Independent Science Advisors (ISA)

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[2] http://planning.lacounty.gov/sea/history

prepared by federal, State, and local agencies were also reviewed. Baseline information for all species assessed prior to the Draft EIS/EIR is included in the Biological Technical Report and its appendices.

Also, the Biological Assessment includes additional and more detailed baseline information on federal listed species, while the Biological Evaluation includes additional information on species that are listed as "sensitive" by the Regional Forester. Areas of suitable habitat and/or known occurrences have been added to Chapter 4 of the Final EIS/EIR to better describe baseline information and the potential for each species to occur. Baseline information has also been added to Chapter 3 of the Final EIS/EIR for species added to the Final EIS/EIR as the result of public comments.

Also refer to Response I-13 above regarding the adequacy of baseline information.

Response I-20: The data provided in the Draft EIS/EIR is adequate, including the surveys conducted for various species during the EIS/EIR preparation. Prior to conducting field surveys, USFS, USFWS, and BLM were consulted to determine survey needs and appropriate survey time frames. Protocol surveys were conducted for the arroyo toad and California red-legged frog, federal- and State-listed plant species, Forest Service Sensitive/Watch plant species, and California Native Plant Society (CNPS) List 1 and 2 species. Surveys were also conducted to determine presence of and suitable habitat for California spotted owl, Joshua trees, special-status bat species, and special-status riparian bird species. Additionally, desert habitat and invasive weed surveys were conducted, along with an avian risk assessment.

Landowner right-of-entry permits are required for conducting biological field surveys on public and private lands. We were able to gain permission to enter some areas to complete surveys, but on private lands where access was not obtained, no surveys were conducted. However, all the alternatives followed existing utility easements. Therefore, biological data was collected within the existing easements that paralleled private lands where access was not granted. Biological data was also collected remotely from public access points or interpreted from aerial photographs. In areas where access was not obtained and potential habitat occurred for threatened and endangered species, we assumed presence. Surveys areas did not always include all of the proposed impact areas (e.g., access roads and staging areas) that occur outside the 500-foot impact corridor because, in most cases, these areas were not known at the time of the surveys. Pre-construction surveys, as described in the mitigation measures, will also be required prior to construction.

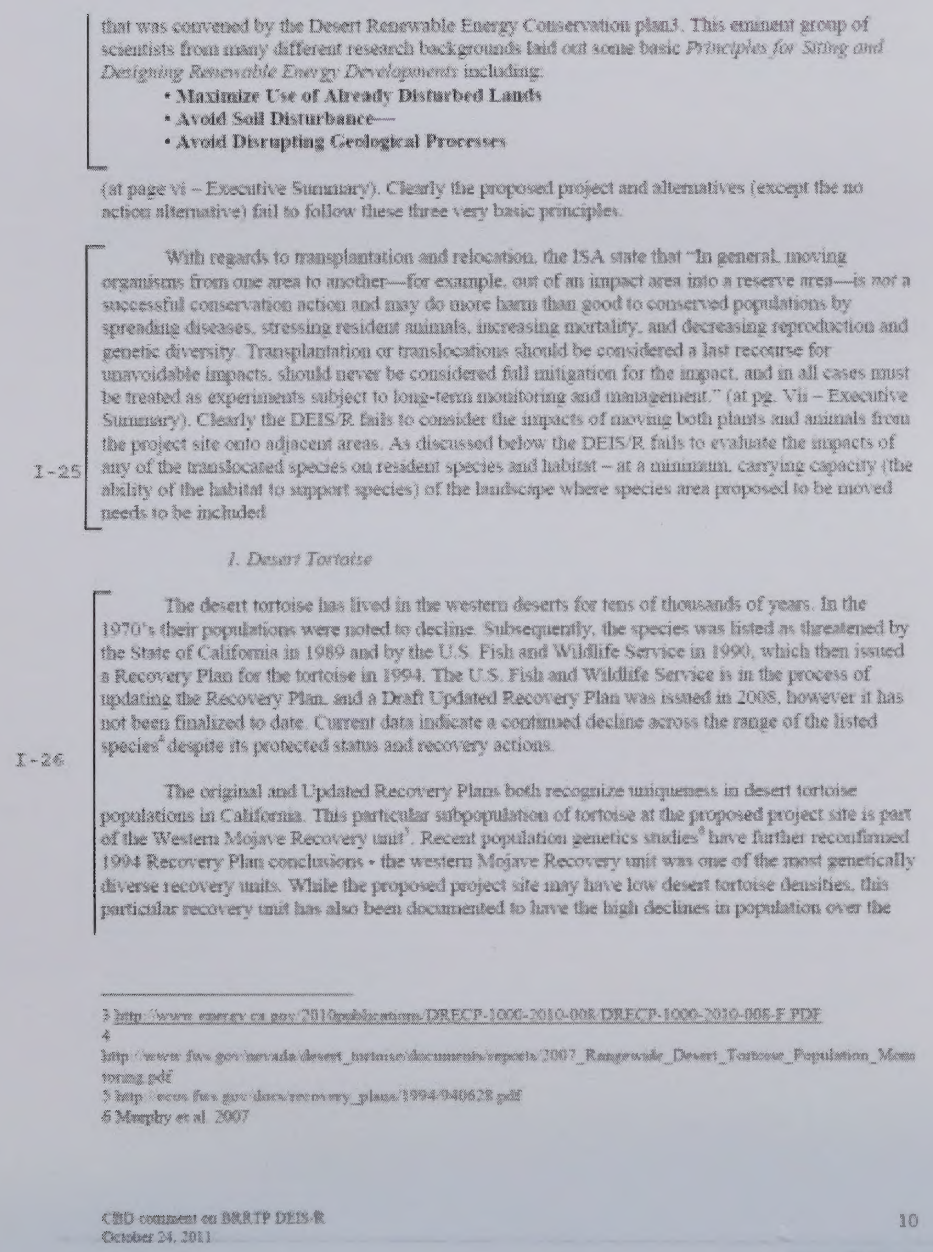
Response I-21: As described in Response I-20 above, the information necessary for decision-makers and the public to adequately and reasonably review the proposed Project has been provided in the Draft and Final EIS/EIR. A supplemental or revised Draft EIS/EIR is not required. Additionally, as described in Chapter 2 of the Final EIS/EIR and the Alternatives Development Report (see Appendix B of the Final EIS/EIR), a reasonable range of Alternatives to the Proposed Action was considered.

Response I-22: Significant Ecological Areas (SEAs) are discussed in the Draft EIS/EIR on pages 3-174, 3-199, 3-204, 3-206, 3-208, 3-210, and 3-174 in Chapter 3 and on pages 4-412, 4-434, 4-462, 4-485, 4-505, 4-506, 4-509, and 4-524 in Chapter 4. Proposed SEAs have no protected status until officially adopted.

Response I-23: Mile marker notations were used in the Draft EIS/EIR and Technical Reports to identify specific geographic locations along the linear portions of the Proposed Action and Alternatives. For the proposed new 230 kV double-circuit transmission line, mileage crossed and number of crossing of sensitive resources were additionally used in the comparison of Alternatives in Section 2.6 of the Final EIS/EIR, Alternatives Comparison Summary. These are normal metrics to compare transmission line issues and effects.

Ground disturbance estimates (acres) are included in the description of the Proposed Action and Alternatives; for example, see Table 2-4, Access and Spur Road Ground Disturbance Estimates, Table 2-5, Staging Site and Batch Plant Ground Disturbance Estimates, and Table 2-7, Ground Disturbance Estimates for the Proposed 230 kV Double-Circuit Transmission Line. We have identified the context and intensity of all impacts, including acreages of impacts where appropriate and the location of the resource or impact by milepost along each alternative. Please refer throughout Chapter 4, Environmental Impacts, and Chapter 5, Cumulative Effects, for the full description and extent of impacts for each resource.

Response I-24: The agencies are familiar with the final recommendations of the Independent Science Advisors, and agree generally with the principles of siting and design of renewable energy developments that they outline. Many of these recommendations were utilized in the siting process for identification of alternatives and in the selection of the agencies' preferred alternative. For example, all the alternatives, with the exception of a limited portion of Alternative 1, are in existing designated corridors or parallel existing lines. The ANF applied helicopter use as mitigation specifically to avoid soil disturbance. Also refer to Response I-3 and Response I-12 regarding the



that was convened by the Desert Renewable Energy Conservation plan3. This eminent group of scientists from many different research backgrounds laid out some basic *Principles for Siting and Designing Renewable Energy Developments* including:

- **Maximize Use of Already Disturbed Lands**
- **Avoid Soil Disturbance—**
- **Avoid Disrupting Geological Processes**

(at page vi – Executive Summary). Clearly the proposed project and alternatives (except the no action alternative) fail to follow these three very basic principles.

With regards to transplantation and relocation, the ISA state that "In general, moving organisms from one area to another—for example, out of an impact area into a reserve area—is *not* a successful conservation action and may do more harm than good to conserved populations by spreading diseases, stressing resident animals, increasing mortality, and decreasing reproduction and genetic diversity. Transplantation or translocations should be considered a last recourse for unavoidable impacts, should never be considered full mitigation for the impact, and in all cases must be treated as experiments subject to long-term monitoring and management." (at pg. Vii – Executive Summary). Clearly the DEIS/R fails to consider the impacts of moving both plants and animals from the project site onto adjacent areas. As discussed below the DEIS/R fails to evaluate the impacts of any of the translocated species on resident species and habitat – at a minimum, carrying capacity (the ability of the habitat to support species) of the landscape where species area proposed to be moved needs to be included I-25

1. Desert Tortoise

The desert tortoise has lived in the western deserts for tens of thousands of years. In the 1970's their populations were noted to decline. Subsequently, the species was listed as threatened by the State of California in 1989 and by the U.S. Fish and Wildlife Service in 1990, which then issued a Recovery Plan for the tortoise in 1994. The U.S. Fish and Wildlife Service is in the process of updating the Recovery Plan, and a Draft Updated Recovery Plan was issued in 2008, however it has not been finalized to date. Current data indicate a continued decline across the range of the listed species[4] despite its protected status and recovery actions.

I-26

The original and Updated Recovery Plans both recognize uniqueness in desert tortoise populations in California. This particular subpopulation of tortoise at the proposed project site is part of the Western Mojave Recovery unit[5]. Recent population genetics studies[6] have further reconfirmed 1994 Recovery Plan conclusions - the western Mojave Recovery unit was one of the most genetically diverse recovery units. While the proposed project site may have low desert tortoise densities, this particular recovery unit has also been documented to have the high declines in population over the

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3 http://www.energy.ca.gov/2010publications/DRECP-1000-2010-008/DRECP-1000-2010-008-F.PDF

4 http://www.fws.gov/nevada/desert_tortoise/documents/reports/2007_Rangewide_Desert_Tortoise_Population_Monitoring.pdf

5 http://ecos.fws.gov/docs/recovery_plans/1994/940628.pdf

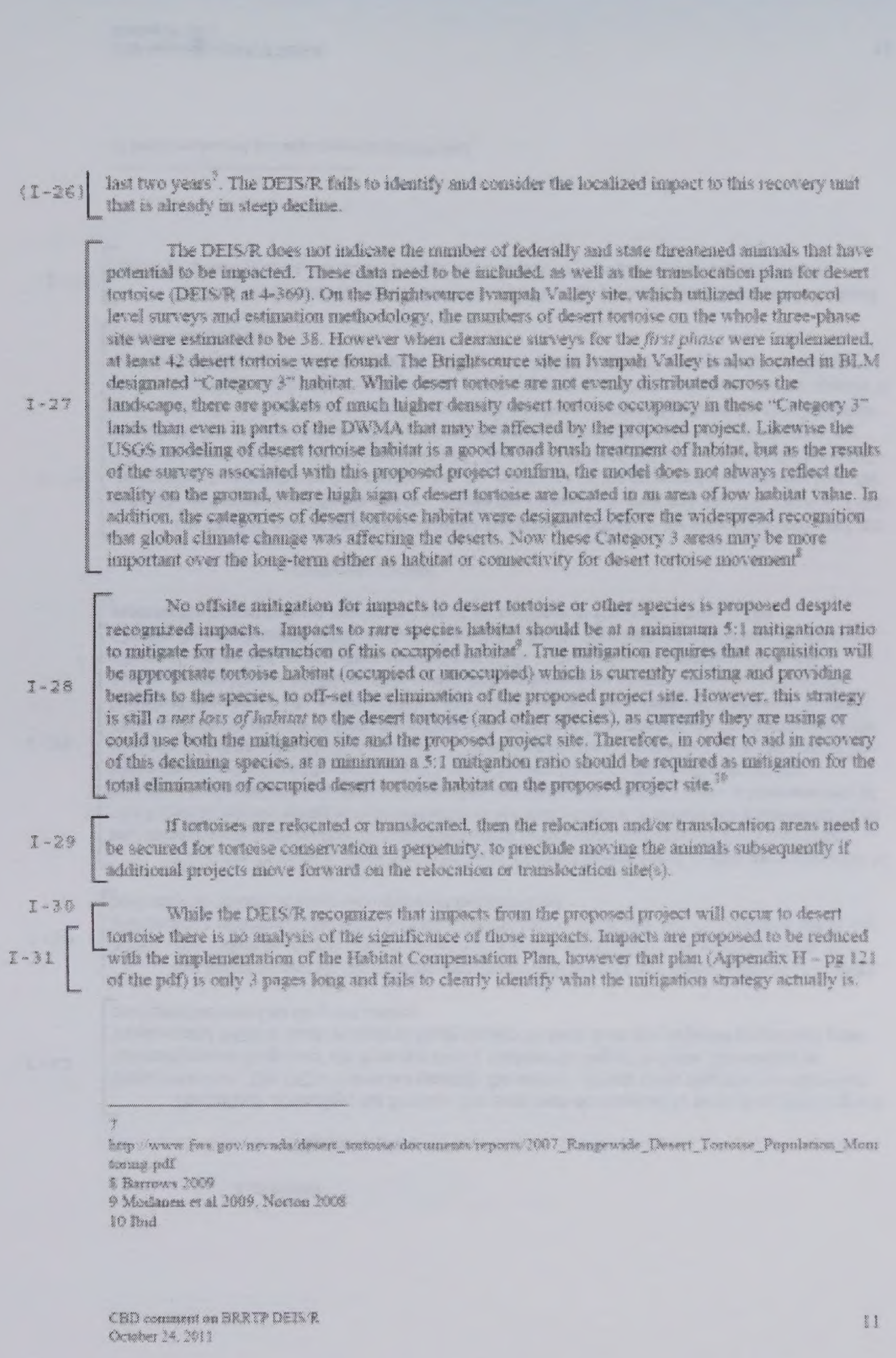
6 Murphy et al. 2007

DRECP. The agencies will consider these and other mitigation strategies in the decision process for this Project.

Response I-25: The Draft EIS/EIR analyzes the potential impacts of relocation on an individual of a given species (e.g., stress, difficulty foraging, predation, loss of reproduction for the year or difficulty reproducing, death), but does not analyze the potential effects of relocation on the existing environment or on resident individuals already living in these areas. The Final EIS/EIR includes additional analysis on potential effects of relocation to resident species that includes effects of relocation on carrying capacity (refer to Section 4.3.1 of the Final EIS/EIR).

Response I-26: The Draft EIS/EIR does analyze the potential impacts to the desert tortoise and potential impacts associated with the proposed Project (e.g., stress, difficulty foraging, predation, loss of reproduction for the year or difficulty reproducing, death), but does not analyze the localized impact to this recovery unit. The Final EIS/EIR includes additional analysis on potential effects of localized impacts to the recovery unit (refer to page 4-443 of the Final EIS/EIR).

Response I-27: A combination of quantitative and qualitative analysis was used in the biological resource analysis in the Draft EIS/EIR. If a biological resource was not detected during the survey effort, we assumed presence or potential to occur based on the habitat present. This assumption required a qualitative approach in areas where survey data did not document the resource but where it still had the potential to occur. In addition, the Draft EIS/EIR includes two tables (plants and animals) in Appendix G that list the species, its status, habitat requirements, and potential location of the species within the Project area. We do not identify the specific number of individual species, as we can not quantify this data since data collected during the surveys only shows a



(I-26) last two years[7]. The DEIS/R fails to identify and consider the localized impact to this recovery unit that is already in steep decline.

I-27 The DEIS/R does not indicate the number of federally and state threatened animals that have potential to be impacted. These data need to be included, as well as the translocation plan for desert tortoise (DEIS/R at 4-369). On the Brightsource Ivanpah Valley site, which utilized the protocol level surveys and estimation methodology, the numbers of desert tortoise on the whole three-phase site were estimated to be 38. However when clearance surveys for the *first phase* were implemented, at least 42 desert tortoise were found. The Brightsource site in Ivanpah Valley is also located in BLM designated "Category 3" habitat. While desert tortoise are not evenly distributed across the landscape, there are pockets of much higher density desert tortoise occupancy in these "Category 3" lands than even in parts of the DWMA that may be affected by the proposed project. Likewise the USGS modeling of desert tortoise habitat is a good broad brush treatment of habitat, but as the results of the surveys associated with this proposed project confirm, the model does not always reflect the reality on the ground, where high sign of desert tortoise are located in an area of low habitat value. In addition, the categories of desert tortoise habitat were designated before the widespread recognition that global climate change was affecting the deserts. Now these Category 3 areas may be more important over the long-term either as habitat or connectivity for desert tortoise movement[8]

I-28 No offsite mitigation for impacts to desert tortoise or other species is proposed despite recognized impacts. Impacts to rare species habitat should be at a minimum 5:1 mitigation ratio to mitigate for the destruction of this occupied habitat[9]. True mitigation requires that acquisition will be appropriate tortoise habitat (occupied or unoccupied) which is currently existing and providing benefits to the species, to off-set the elimination of the proposed project site. However, this strategy is still *a net loss of habitat* to the desert tortoise (and other species), as currently they are using or could use both the mitigation site and the proposed project site. Therefore, in order to aid in recovery of this declining species, at a minimum a 5:1 mitigation ratio should be required as mitigation for the total elimination of occupied desert tortoise habitat on the proposed project site.[10]

I-29 If tortoises are relocated or translocated, then the relocation and/or translocation areas need to be secured for tortoise conservation in perpetuity, to preclude moving the animals subsequently if additional projects move forward on the relocation or translocation site(s).

I-30 While the DEIS/R recognizes that impacts from the proposed project will occur to desert tortoise there is no analysis of the significance of those impacts. I-31 Impacts are proposed to be reduced with the implementation of the Habitat Compensation Plan, however that plan (Appendix H – pg 121 of the pdf) is only 3 pages long and fails to clearly identify what the mitigation strategy actually is.

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[7] http://www.fws.gov/nevada/desert_tortoise/documents/reports/2007_Rangewide_Desert_Tortoise_Population_Monitoring.pdf

[8] Barrows 2009

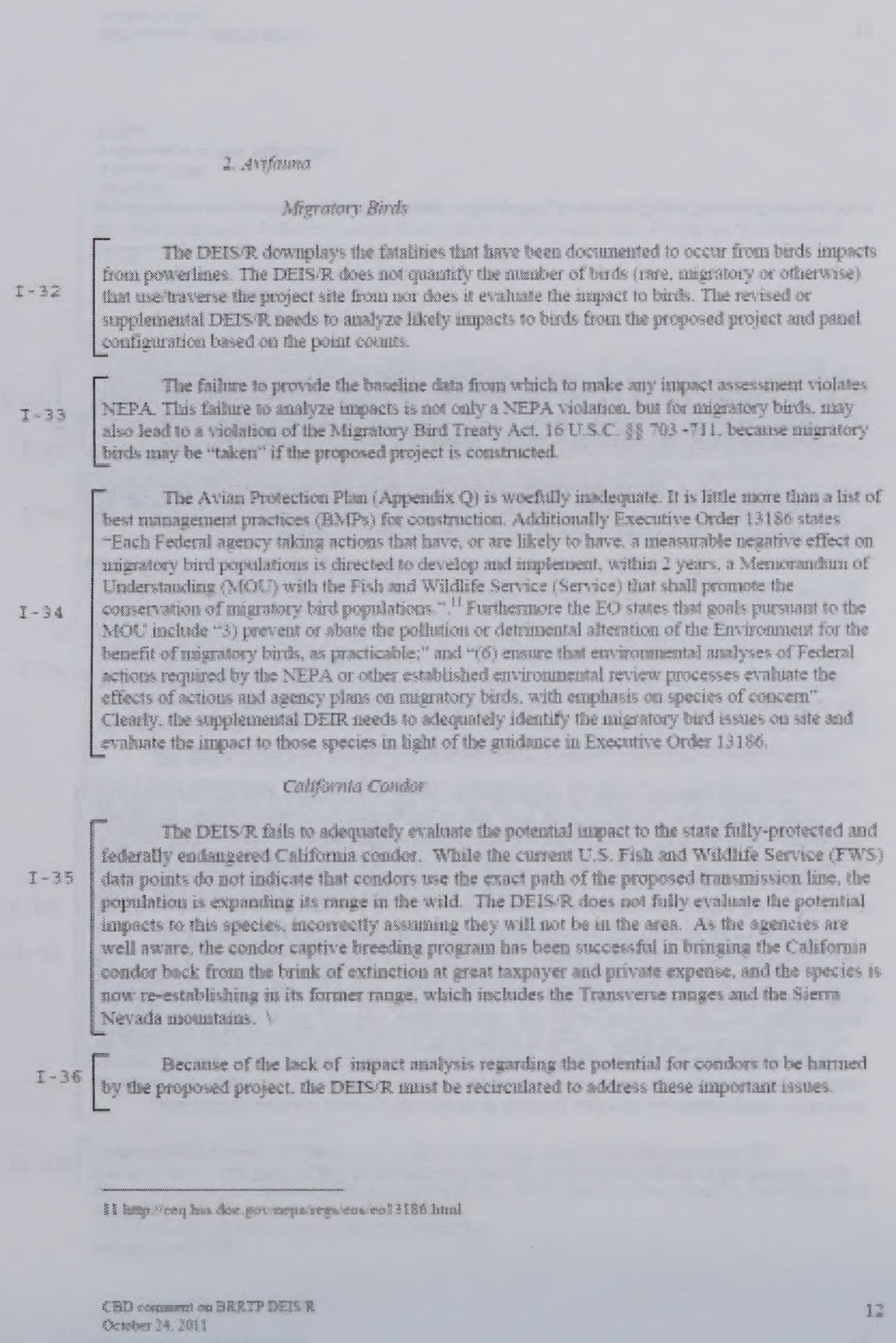
[9] Moilanen et al 2009, Norton 2008

[10] Ibid

snapshot of species that may potentially be present. However, we have included additional language on page 3-152 of the Final EIS/EIR that states the total number of listed species that have the potential to occur. Also see Response I-25 regarding a desert tortoise translocation plan. Also refer to the Biological Opinion for the incidental take statement.

Response I-28: The Draft EIS/EIR does not identify the specific locations for mitigation land because it is not practical or reasonable to identify available mitigation land for each of the various alternatives analyzed in the EIS/EIR prior to a final decision on Project approval, as the extent of impacts to different habitat types varies among the alternatives. However, if on-site mitigation is not feasible, mitigation measure BIO-1a of the Final EIS/EIR states that LADWP shall find adequate mitigation lands acceptable to the various wildlife and regulatory agencies. The mitigation land would compensate for the loss of sensitive vegetation. It also would compensate for the loss of occupied habitat. Offsite mitigation acquisition would occur at a USFWS- and CDFG-approved location and would be coordinated through a USFWS- and CDFG-approved entity. The mitigation ratios listed in BIO-1 were developed in consultation with the BLM and USFS and would be based primarily on the requirements established in regional habitat conservation programs and also on mitigation required for other projects. The mitigation ratios would include off-site mitigation ratios. Specific locations of off-site mitigation would be determined only after the Biological Opinion and issuance of the Final EIS/EIR.

Response I-29: As outlined in mitigation measure BIO-23f of the Final EIS/EIR (refer to page 4-361), if tortoises are found above ground during construction and need to be moved, they will not be placed more than 1,000 feet from where they are found. In addition, mitigation measure BIO-23e of the Final EIS/EIR (see



2. Avifauna

Migratory Birds

I-32 The DEIS/R downplays the fatalities that have been documented to occur from birds impacts from powerlines. The DEIS/R does not quantify the number of birds (rare, migratory or otherwise) that use/traverse the project site from nor does it evaluate the impact to birds. The revised or supplemental DEIS/R needs to analyze likely impacts to birds from the proposed project and panel configuration based on the point counts.

I-33 The failure to provide the baseline data from which to make any impact assessment violates NEPA. This failure to analyze impacts is not only a NEPA violation, but for migratory birds, may also lead to a violation of the Migratory Bird Treaty Act, 16 U.S.C. §§ 703 -711, because migratory birds may be "taken" if the proposed project is constructed.

I-34 The Avian Protection Plan (Appendix Q) is woefully inadequate. It is little more than a list of best management practices (BMPs) for construction. Additionally Executive Order 13186 states "Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations.".[11] Furthermore the EO states that goals pursuant to the MOU include "3) prevent or abate the pollution or detrimental alteration of the Environment for the benefit of migratory birds, as practicable;" and "(6) ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern". Clearly, the supplemental DEIR needs to adequately identify the migratory bird issues on site and evaluate the impact to those species in light of the guidance in Executive Order 13186.

California Condor

I-35 The DEIS/R fails to adequately evaluate the potential impact to the state fully-protected and federally endangered California condor. While the current U.S. Fish and Wildlife Service (FWS) data points do not indicate that condors use the exact path of the proposed transmission line, the population is expanding its range in the wild. The DEIS/R does not fully evaluate the potential impacts to this species, incorrectly assuming they will not be in the area. As the agencies are well aware, the condor captive breeding program has been successful in bringing the California condor back from the brink of extinction at great taxpayer and private expense, and the species is now re-establishing in its former range, which includes the Transverse ranges and the Sierra Nevada mountains. \

I-36 Because of the lack of impact analysis regarding the potential for condors to be harmed by the proposed project, the DEIS/R must be recirculated to address these important issues.

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[11] http://ceq.hss.doe.gov/nepa/regs/eos/eo13186.html

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page 4-361) states that a translocation plan would be approved by the wildlife agencies prior to removal or handling of tortoise. This plan would include identifying land for conservation, and this process would be coordinated through a USFWS- and CDFG-approved entity. The translocation plan would be developed only after the issuance of the Final EIS/EIR and after the USFWS issues its Biological Opinion.

Response I-30: The Draft EIS/EIR included best efforts to investigate and disclose environmental information (see CEQA Guidelines § 15144) and used all available resources, including surveys, to determine the baseline information on the desert tortoise. An analysis was also conducted on the desert tortoise, and mitigation measures were identified based on this analysis (e.g., mitigation measure BIO-23). In addition, coordination with USFWS and CDFG continues as this Project undergoes Section 7 consultations and the Section 2081 process, respectively.

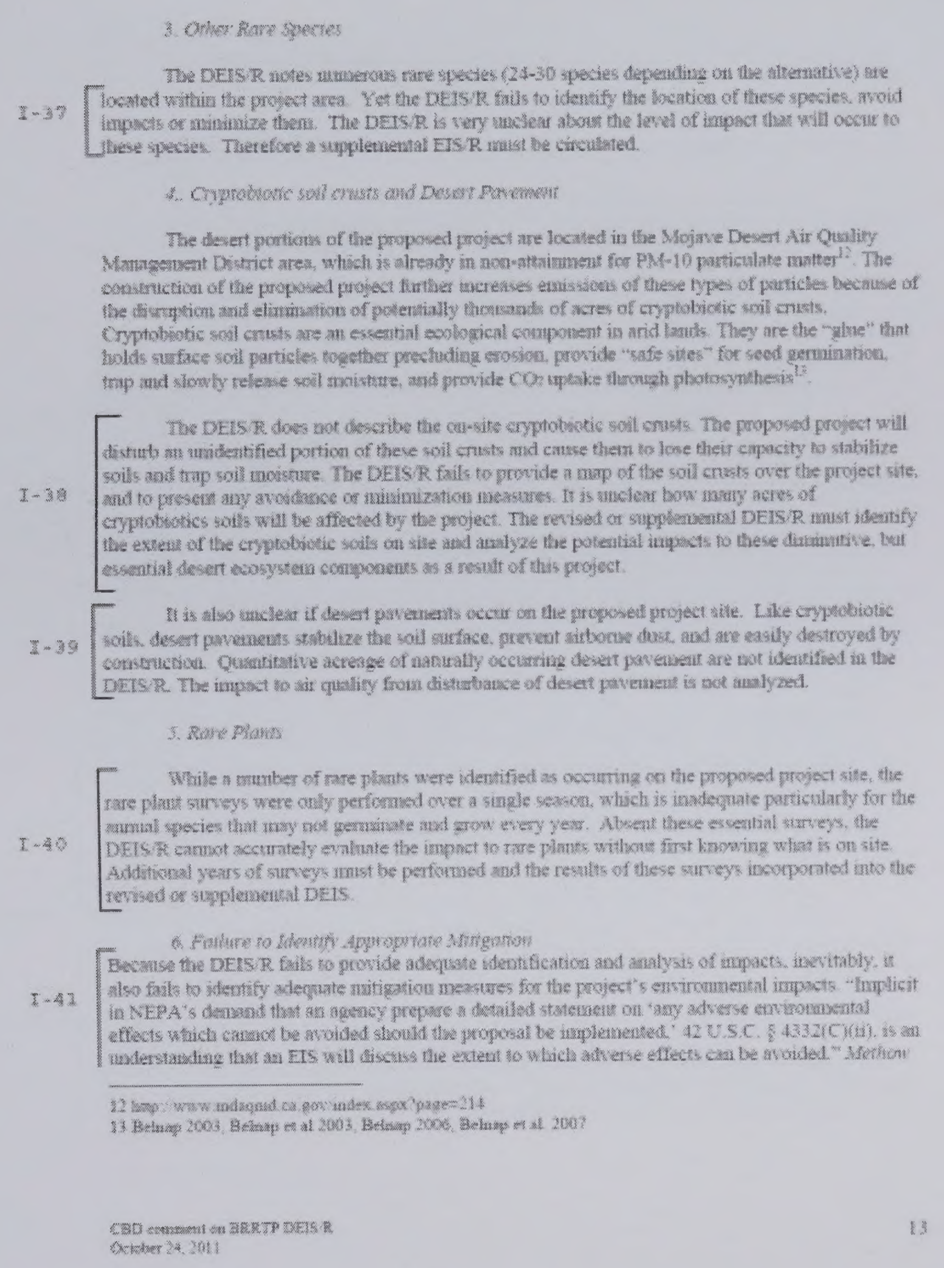
Response I-31: A Habitat Restoration and Revegetation Plan is one of many measures proposed to reduce potential impacts to biological resources, including the desert tortoise. A formal Habitat Conservation Plan associated with Section 10a of the Endangered Species Act is not a part of this Project. The measures proposed in BIO-23 on pages 4-361 and 4-362 of the Final EIS/EIR are designed to protect the desert tortoise. This measure includes the development of a translocation plan that will outline how the tortoise will be handled and relocated. Coordination with USFWS and CDFG would continue through the Section 7 consultations and the Section 2081 process.

Response I-32: The Draft EIS/EIR incorporated avian power line interactions into its analysis by several means. An Avian Protection Plan for construction of the BRRTP was included as Appendix Q in the Draft EIS/EIR following an avian risk assessment conducted in 2008 that analyzed the risk for collision and electrocution along the Project alternatives. While the assessment report itself was not included in the Draft EIS/EIR, its results were incorporated into the discussion of potential effects for each Project segment in the Biological Technical Report (pages 249, 258, 268, 281, 291, 297, 303, 308, 322, 329, 336, and 350), which was included in Volume IV. Similar discussions were included in the account of potential impacts from each alternative in Chapter 4 of the Final EIS/EIR. The number of birds using the Project area cannot be quantified because different numbers of birds may be present within the Project area from day to day depending on the time of year and the species that may reside in or migrate through the area. Some species may be present within the Project area throughout the year, others may stay within the Project area for an extended period while migrating; some may spend a single day as a stopover rest, and others may fly through without stopping. Some species may be active and foraging during the day while others are night migrants and will remain relatively inconspicuous during the day. Due to the large size of the Project and the long span from Sylmar to the Barren Ridge Switching Station, resource limitations prevent obtaining a full picture of the exact number of birds that utilize the Project area. However, snapshots of bird use can be obtained from biological surveys, including point count surveys that were conducted in 2010 and 2011. The results of the point count surveys helped to build a species list of which birds could and did occur in the Project area at the time of the surveys, and the discussions and analyses of special-status bird species in the Biological Technical Report (pages 123, 275, and 367), Draft EIS/EIR (pages 3-160, 4-390, and 4-436), and Final EIS/EIR (pages 4-384, 4-409, 4-430, 4-447, 4-450, 4-474, 4-499, and 4-518) were revised to reflect the results of these surveys, where applicable. This species list is likely not exhaustive and is not intended to represent the quantity of individual birds in the Project area; however, it illustrates how many birds were detected at specific sites at specific times and on specific dates.

Response I-33: Potential collision and electrocution risks to migratory birds are discussed for each Project segment in the biological technical report (under the heading "Avian Risk" in each segment's impacts discussion, on pages 249, 258, 268, 281, 297, 303, 308, 322, 329, 336, and 350). These and general Project effects to migratory birds are discussed for each Project alternative in Section 4.3.2 of the Final EIS/EIR (under the heading "Migratory Birds" in each alternative's impacts discussion, on pages 4-426, 4-458, 4-480, 4-503, and 4-523).

Chapter 3 of the Draft EIS/EIR does not include a baseline analysis of bird activity. However, Chapter 3 of the Final EIS/EIR includes a discussion of avian baseline conditions based on the 2008 avian risk assessment surveys, 2011 avian point count surveys, and noted incidental observations of avian species within the BRRTP area (refer to pages 3-156, 3-159, 3-162, 3-164, 3-168, 3-173, 3-178, and 3-182). This information meets NEPA requirements for adequate description of the affected environment, which are described in regulation as being "no longer than is necessary to understand the effects of the alternatives." Impact discussions within Chapter 4 of the Final EIS/EIR have been revised following the expanded baseline conditions section in Chapter 3 (refer to pages Section 4.3.1, pages 4-364 through 4-530).

Response I-34: Prior to developing the Avian Protection Plan (APP), an avian risk assessment was conducted following guidelines provided by the Avian Power Line Interaction Committee (APLIC). The risk assessment determined areas of greatest risk to birds and measures to avoid and mitigate avian risk. This data was used to develop the Draft APP. The Final APP addresses both CDFG and USFWS comments and will be finalized



3. Other Rare Species

I-37 The DEIS/R notes numerous rare species (24-30 species depending on the alternative) are located within the project area. Yet the DEIS/R fails to identify the location of these species, avoid impacts or minimize them. The DEIS/R is very unclear about the level of impact that will occur to these species. Therefore a supplemental EIS/R must be circulated.

4.. Cryptobiotic soil crusts and Desert Pavement

The desert portions of the proposed project are located in the Mojave Desert Air Quality Management District area, which is already in non-attainment for PM-10 particulate matter[12]. The construction of the proposed project further increases emissions of these types of particles because of the disruption and elimination of potentially thousands of acres of cryptobiotic soil crusts. Cryptobiotic soil crusts are an essential ecological component in arid lands. They are the "glue" that holds surface soil particles together precluding erosion, provide "safe sites" for seed germination, trap and slowly release soil moisture, and provide CO_2 uptake through photosynthesis[13].

I-38 The DEIS/R does not describe the on-site cryptobiotic soil crusts. The proposed project will disturb an unidentified portion of these soil crusts and cause them to lose their capacity to stabilize soils and trap soil moisture. The DEIS/R fails to provide a map of the soil crusts over the project site, and to present any avoidance or minimization measures. It is unclear how many acres of cryptobiotics soils will be affected by the project. The revised or supplemental DEIS/R must identify the extent of the cryptobiotic soils on site and analyze the potential impacts to these diminutive, but essential desert ecosystem components as a result of this project.

I-39 It is also unclear if desert pavements occur on the proposed project site. Like cryptobiotic soils, desert pavements stabilize the soil surface, prevent airborne dust, and are easily destroyed by construction. Quantitative acreage of naturally occurring desert pavement are not identified in the DEIS/R. The impact to air quality from disturbance of desert pavement is not analyzed.

5. Rare Plants

I-40 While a number of rare plants were identified as occurring on the proposed project site, the rare plant surveys were only performed over a single season, which is inadequate particularly for the annual species that may not germinate and grow every year. Absent these essential surveys, the DEIS/R cannot accurately evaluate the impact to rare plants without first knowing what is on site. Additional years of surveys must be performed and the results of these surveys incorporated into the revised or supplemental DEIS.

6. Failure to Identify Appropriate Mitigation

I-41 Because the DEIS/R fails to provide adequate identification and analysis of impacts, inevitably, it also fails to identify adequate mitigation measures for the project's environmental impacts. "Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' 42 U.S.C. § 4332(C)(ii), is an understanding that an EIS will discuss the extent to which adverse effects can be avoided." *Methow*

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[12] http://www.mdaqmd.ca.gov/index.aspx?page=214
[13] Belnap 2003, Belnap et al 2003, Belnap 2006, Belnap et al. 2007

in coordination with both agencies. A separate APP would be prepared for operation and maintenance (O&M) work.

Response I-35: The mitigation measures identified in the Final EIS/EIR commit the USFS, BLM and LADWP to specific standards of performance to avoid and minimize impacts. Furthermore, any additional reasonable mitigation measures required by the USFWS to minimize impacts to California condors would be adopted by the agencies. The discussion of potential impacts to this species has been expanded to note that California condors are increasingly exploring their historical range and may be subject to more electrocution, collision, and noise risk.

Response I-36: The discussion of potential impacts to condors has been expanded in the Final EIS/EIR to note that California condors are increasingly exploring their historical range and may be subject to more electrocution, collision, and noise risk. Please refer to pages 4-377, 4-403, 4-404,4-441, 4-442, 4-469, 4-470, 4-496, and 4-513 of the Final EIS/EIR and to the Biological Assessment (Appendix H to the Final EIS/EIR). With the addition of this information, the Draft EIS/EIR is adequate and will not be re-circulated..

Response I-37: The location of the species was provided in the Maps Volume (refer to Wildlife Species Map and Sensitive Plant and Weed Species Map of Volume V of the Final EIS/EIR), which included individual species locations and plant populations. Each rare species that was identified in the Project area was analyzed in detail in the Biological Technical Report and summarized in Section 4.3.1 of the Final EIS/EIR.

Response I-38: These biological soil crusts can be found in the various vegetation communities and soil series that were identified throughout the Project area. Several mitigation measures already identified in the Draft EIS/EIR, such as the Fugitive Dust mitigation measure (AIR-2a) on page 4-10 of the Final EIS/EIR, would protect these soils where they occur. The Final EIS/EIR includes a section on page 3-155 that specifically discusses cryptobiotic soils and the mitigation measures that would be implemented to protect this resource.

Response I-39: Based on the vegetation mapping and data collected in the field, desert pavements were not identified.

Response I-40: Rare plant surveys were conducted over a three-year period, which incorporated several seasons. The botanical surveys were performed during the time of year that most species would be detectable on both USFS land and BLM-managed land. It is possible that, even with multiple seasons of rare plant surveys, the diversity and density observed may be higher or lower depending on if it is an optimal year. During the 2008 and 2009 rare plant surveys, portions of the Project area were burned and species observed were lower than what would be seen in a most favorable year. Based on the rare plant surveys conducted in 2008, 2009, and 2010, we were able to determine which species had the potential to occur. Additional data was also gathered from USFS botanists and from the Southern California Edison's Antelope-Pardee project, which overlapped with the BRRTP study area. Where access was possible, rare plant surveys were conducted; although we acknowledge that not all species may have been detected (also refer to mitigation measure BIO-13 on page 4-355 of the Final EIS/EIR). This information meets NEPA requirements for adequate description of the affected environment, which are described in regulation as being "no longer than is necessary to understand the effects of the alternatives."

Additionally, mitigation measure BIO-13 requires another season of rare plant surveys around all areas subject to ground-disturbing activity including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by a qualified plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS.

Response I-41: This comment does not cite any specific inadequacies in the Draft EIS/EIR requiring a response. The data collection, analysis, and mitigation measures in the Draft EIS/EIR are adequate for decision-making by the agencies. Chapters 3, 4, and 5 of the Draft and Final EIS/EIR, in their entirety, describe the existing setting, analysis of impacts from the Proposed Action and cumulative impacts, and mitigation.

It is unclear from the comment which resource analysis the Center for Biological Diversity finds lacking; however, the Draft EIS/EIR provides for all resources an analysis of mitigation measures where applicable, as well as an assessment of the measures' ability to reduce or avoid potential impacts. As described in Section 4.1.1, Impact Assessment Process, on pages 4-2 through 4-5 in Chapter 4 of the Final EIS/EIR, for each resource, mitigation measures were examined after the identification of impact intensity, duration, and locations to see if they could reduce either the intensity or duration of impacts. Where feasible, mitigation measures were identified that would reduce significant impacts to a less-than-significant level. Mitigation measures were applied individually to impacts or were combined with other mitigation measures to reduce or even eliminate impacts. For each resource in Chapter 4 of the Final EIS/EIR, the discussion of potential mitigation measures can be found under the subtitle Mitigation Planning, and an analysis of the measures' potential to reduce impacts is described under the subheading Summary of Impact Analysis Results.

(I-41) *Valley*. 490 U.S. at 351-52. Because the DEIS/R does not adequately assess the project's direct, indirect, and cumulative impacts, its analysis of mitigation measures for those impacts is necessarily flawed. The DEIS/R must discuss mitigation in sufficient detail to ensure that environmental consequences have been fairly evaluated." *Methow Valley*, 490 U.S. at 352; *see also Idaho Sporting Congress*, 137 F.3d at 1151 ("[w]ithout analytical detail to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a 'mere listing' of good management practices"). As the Supreme Court clarified in *Robertson*, 490 U.S. at 352, the "requirement that an EIS contain a detailed discussion of possible mitigation measures flows both from the language of [NEPA] and, more expressly, from CEQ's implementing regulations" and the "omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action forcing' function of NEPA."

Although NEPA does not require that the harms identified actually be mitigated, NEPA does require that an EIS discuss mitigation measures, with "sufficient detail to ensure that environmental consequences have been fairly evaluated" and the purpose of the mitigation discussion is to evaluate whether anticipated environmental impacts *can be avoided*. *Methow Valley*, 490 U.S. at 351-52. As the Ninth Circuit recently noted: "[a] mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination." *Fork Band Council of Western Shoshone v. DOI*, 588 F.3d 718 , 727 (9th Cir. 2009) (emphasis in original).

I-42 Here, the DEIS/R does not provide a full analysis of possible mitigation measures to avoid or lessen the impacts of the proposed project and therefore the BLM cannot properly assess the likelihood that such measures would actually avoid the impacts of the proposed project.

D. Impacts to Water Resources— Surface and Water Impacts

I-43 As the DEIS/R notes, the proposed project will impact a large number of washes and ephemeral streams and is on an alluvial fan. These areas provide important habitat values that will be lost by the construction of the proposed for the project site. Moreover, the loss of natural surface water flows and the re-direction of surface waters will likely have significant impacts. The impacts on soils from the proposed project have not been adequately addressed in the DEIS.

Ephemeral and intermittent streams make up over 81% in the arid and semi-arid southwest (Arizona, New Mexico, Nevada, Utah, Colorado and California). These streams provide a variety of ecosystem services including

- landscape hydrologic connections;
- stream energy dissipation during high-water flows to reduce erosion and improve water quality;
- surface and subsurface water storage and exchange;
- ground-water recharge and discharge;
- sediment transport, storage, and deposition to aid in floodplain maintenance and development;
- nutrient storage and cycling;
- wildlife habitat and migration corridors;
- support for vegetation communities to help stabilize stream banks and provide wildlife services;
- and water supply and water-quality filtering[14].

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[14] Levick et al. 2008

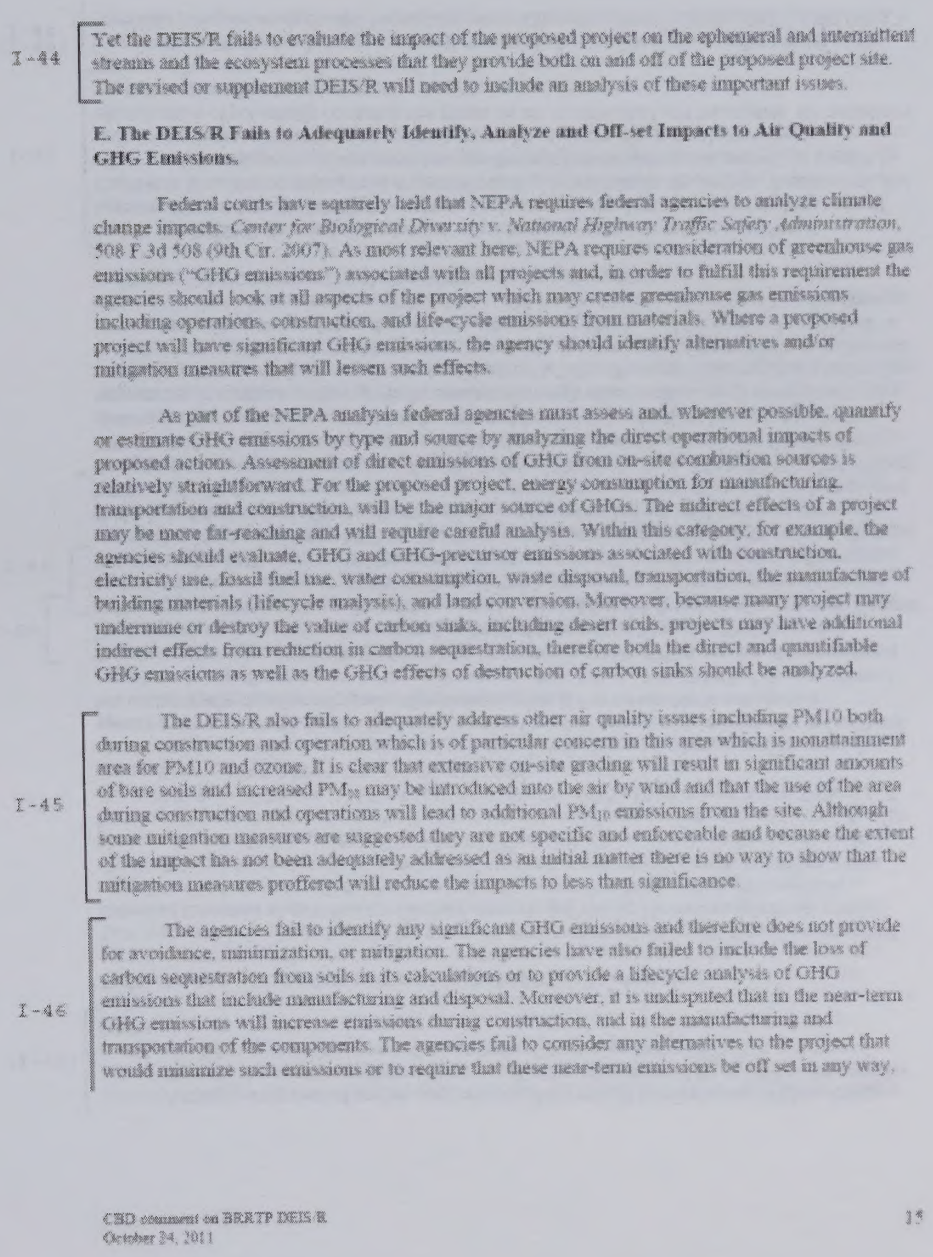
Response I-42: See Response I-41 above.

Response I-43: The proposed Project would use existing access roads to the extent possible. No new permanent roads are proposed on the alluvial fan portion of the Project, and it is not anticipated that existing drainages will be redirected or lost as result of the Project.

Impacts on soils resulting from the proposed Project are addressed on page 4-455 of the Draft EIS/EIR, and in Section 7.1.1 of the Preliminary Geotechnical Evaluation, located in Volume IV of the Final EIS/EIR. Impact to soils was determined to be less than significant with mitigation.

The potential for Project-related impacts to ephemeral and intermittent streams was analyzed in Section 6.5.1 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR. While ephemeral drainages were not specifically addressed in the Draft EIS/EIR due to their numbers, they were considered in the analysis of impacts.

General Practices have been developed that will serve to maintain the pre-Project hydrograph, primarily through avoidance where feasible. General Practice GP-53 specifies the incorporation of riparian area avoidance and permit measures and General Practice GP-54 specifies the avoidance of impacting streambeds and banks (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR). Additionally, the mitigation measures included in Table 4.3.3-1 in Chapter 4 of the Final EIS/EIR would ensure that impacts and alterations to riparian areas would be minimized. HYD-1 and HYD-2 address the construction, operation, and closing of access roads and routes to minimize impacts to water resources. HYD-3 requires that new impervious areas associated with temporary construction be restored to existing conditions after construction.



I-44 Yet the DEIS/R fails to evaluate the impact of the proposed project on the ephemeral and intermittent streams and the ecosystem processes that they provide both on and off of the proposed project site. The revised or supplement DEIS/R will need to include an analysis of these important issues.

E. The DEIS/R Fails to Adequately Identify, Analyze and Off-set Impacts to Air Quality and GHG Emissions.

Federal courts have squarely held that NEPA requires federal agencies to analyze climate change impacts. *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 508 F.3d 508 (9th Cir. 2007). As most relevant here, NEPA requires consideration of greenhouse gas emissions ("GHG emissions") associated with all projects and, in order to fulfill this requirement the agencies should look at all aspects of the project which may create greenhouse gas emissions including operations, construction, and life-cycle emissions from materials. Where a proposed project will have significant GHG emissions, the agency should identify alternatives and/or mitigation measures that will lessen such effects.

As part of the NEPA analysis federal agencies must assess and, wherever possible, quantify or estimate GHG emissions by type and source by analyzing the direct operational impacts of proposed actions. Assessment of direct emissions of GHG from on-site combustion sources is relatively straightforward. For the proposed project, energy consumption for manufacturing, transportation and construction, will be the major source of GHGs. The indirect effects of a project may be more far-reaching and will require careful analysis. Within this category, for example, the agencies should evaluate, GHG and GHG-precursor emissions associated with construction, electricity use, fossil fuel use, water consumption, waste disposal, transportation, the manufacture of building materials (lifecycle analysis), and land conversion. Moreover, because many project may undermine or destroy the value of carbon sinks, including desert soils, projects may have additional indirect effects from reduction in carbon sequestration, therefore both the direct and quantifiable GHG emissions as well as the GHG effects of destruction of carbon sinks should be analyzed.

I-45 The DEIS/R also fails to adequately address other air quality issues including PM10 both during construction and operation which is of particular concern in this area which is nonattainment area for PM10 and ozone. It is clear that extensive on-site grading will result in significant amounts of bare soils and increased PM_{10} may be introduced into the air by wind and that the use of the area during construction and operations will lead to additional PM_{10} emissions from the site. Although some mitigation measures are suggested they are not specific and enforceable and because the extent of the impact has not been adequately addressed as an initial matter there is no way to show that the mitigation measures proffered will reduce the impacts to less than significance.

I-46 The agencies fail to identify any significant GHG emissions and therefore does not provide for avoidance, minimization, or mitigation. The agencies have also failed to include the loss of carbon sequestration from soils in its calculations or to provide a lifecycle analysis of GHG emissions that include manufacturing and disposal. Moreover, it is undisputed that in the near-term GHG emissions will increase emissions during construction, and in the manufacturing and transportation of the components. The agencies fail to consider any alternatives to the project that would minimize such emissions or to require that these near-term emissions be off set in any way.

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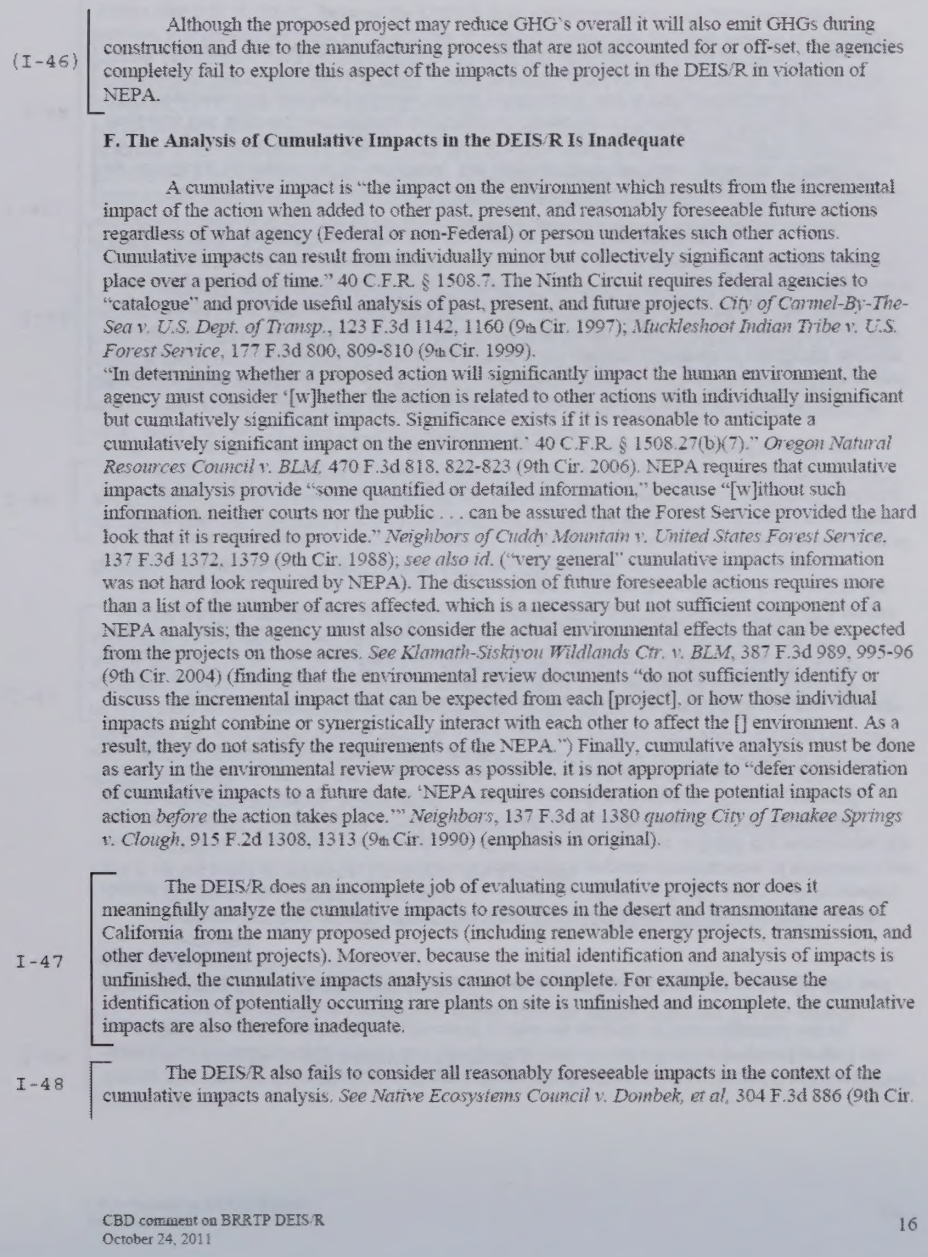
HYD-4 would ensure that drainage within switching station walls would be designed to minimize erosion and increase sediment control. An analysis of any potential hydro-modification impacts on upstream and downstream reaches would be conducted during the permitting stage, as required, and when a survey of specific streambeds could be conducted.

The ANF requested an evaluation of the potential for Project-related erosion and related changes to hydrology of ANF lands that could result from construction of each alternative. Subsequently, two models were utilized to analyze effects of construction and operation of the Project alternatives on sedimentation and erosion. A RUSLE (Revised Universal Soil Loss Equation) analysis was prepared to predict the rate of erosion that would potentially result from construction and operation of the BRRTP within the ANF. Furthermore, a statistical analysis (WinTR-55) of affected sixth-level watersheds within the ANF was performed to predict peak flow within the watersheds pre- and post-construction. The results of these analyses were incorporated into the impact assessment for each Project alternative, and adverse effects were determined to be less than significant for each alternative. For details of these analyses, please refer to the BRRTP Water Resources and Hydrology Supplemental Technical Report, located in Volume IV of the Final EIS/EIR (refer to pages 40 through 42, and to Appendices B and C). Results of the RUSLE analysis are located in Appendix A of the Supplemental Report (refer to pages 4, 6, and 8).

For additional information on on-site and off-site ecosystem impacts, please refer to Sections 6.1 through 6.3.6 of the Biological Resources Technical Report located in Volume IV of the Final EIS/EIR.

Response I-44: Refer to Response I-43.



(I-46) Although the proposed project may reduce GHG's overall it will also emit GHGs during construction and due to the manufacturing process that are not accounted for or off-set, the agencies completely fail to explore this aspect of the impacts of the project in the DEIS/R in violation of NEPA.

F. The Analysis of Cumulative Impacts in the DEIS/R Is Inadequate

A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. The Ninth Circuit requires federal agencies to "catalogue" and provide useful analysis of past, present, and future projects. *City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142, 1160 (9th Cir. 1997); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809-810 (9th Cir. 1999).
"In determining whether a proposed action will significantly impact the human environment, the agency must consider '[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.' 40 C.F.R. § 1508.27(b)(7)." *Oregon Natural Resources Council v. BLM*, 470 F.3d 818, 822-823 (9th Cir. 2006). NEPA requires that cumulative impacts analysis provide "some quantified or detailed information," because "[w]ithout such information, neither courts nor the public . . . can be assured that the Forest Service provided the hard look that it is required to provide." *Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1988); *see also id.* ("very general" cumulative impacts information was not hard look required by NEPA). The discussion of future foreseeable actions requires more than a list of the number of acres affected, which is a necessary but not sufficient component of a NEPA analysis; the agency must also consider the actual environmental effects that can be expected from the projects on those acres. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995-96 (9th Cir. 2004) (finding that the environmental review documents "do not sufficiently identify or discuss the incremental impact that can be expected from each [project], or how those individual impacts might combine or synergistically interact with each other to affect the [] environment. As a result, they do not satisfy the requirements of the NEPA.") Finally, cumulative analysis must be done as early in the environmental review process as possible, it is not appropriate to "defer consideration of cumulative impacts to a future date. 'NEPA requires consideration of the potential impacts of an action *before* the action takes place.'" *Neighbors*, 137 F.3d at 1380 *quoting City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1313 (9th Cir. 1990) (emphasis in original).

I-47 The DEIS/R does an incomplete job of evaluating cumulative projects nor does it meaningfully analyze the cumulative impacts to resources in the desert and transmontane areas of California from the many proposed projects (including renewable energy projects, transmission, and other development projects). Moreover, because the initial identification and analysis of impacts is unfinished, the cumulative impacts analysis cannot be complete. For example, because the identification of potentially occurring rare plants on site is unfinished and incomplete, the cumulative impacts are also therefore inadequate.

I-48 The DEIS/R also fails to consider all reasonably foreseeable impacts in the context of the cumulative impacts analysis. *See Native Ecosystems Council v. Dombek, et al*, 304 F.3d 886 (9th Cir.

Response I-45: The Draft EIS/EIR did address emissions of PM_{10} in the analysis of air quality impacts, identified emissions of PM_{10} as a significant impact, and is adequate for the agencies' review and decision processes. Emissions of PM_{10} were calculated for grading, road construction, and travel on unpaved surfaces during construction. Mitigation measures that are enforceable are proposed to reduce emissions of PM_{10} to the extent possible as presented in mitigation measure AIR-2-a, which requires development and implementation of a Construction Fugitive Dust Emission Control Plan (FDECP). The FDECP, which is required prior to construction, would be developed and implemented by the construction contractor, and would include measures identified in the Draft EIS/EIR to mitigate emissions of fugitive dust (see page 4-11 of the Draft EIS/EIR). These measures include watering of active sites, use of non-toxic soil binders, covering of trucks, and other measures that are specific. Any mitigation measure selected by a lead agency would be enforceable by operation of law or incorporation into right-of-way grants or Special Use Authorizations.

Response I-46: The Draft EIS/EIR adequately addressed emissions of greenhouse gases (GHGs) in Air Quality, Section 4.2.1. In accordance with SCAQMD guidance, construction GHG emissions are amortized over a 30-year period to account for their contribution over the lifetime of the Project and were shown to be below the SCAQMD's draft significance threshold. It would be speculative to calculate emissions of GHGs from the manufacturing process because the specific source of materials is not identified at this time. A life-cycle analysis such as that suggested in the comment would therefore be speculative, and is not currently required by either CEQA or NEPA regulations or guidelines. The comment suggests that carbon sinks, such as desert soils, would be undermined or destroyed during construction

(I-48) 2002) (finding future timber sales and related forest road restriction amendments were "reasonably foreseeable cumulative impacts"). The DEIS/R also fails to provide the needed analysis of how the impacts might combine or synergistically interact to affect the environment in this valley or region. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995-96 (9th Cir. 2004).

The NEPA regulations also require that indirect effects including changes to land use patterns and induced growth be analyzed. "Indirect effects," include those that "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include *growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems*." 40 C.F.R. s.1508.8(b) (emphasis added). *See TOMAC v. Norton*, 240 F. Supp.2d 45, 50-52 (D.D.C. 2003) (finding NEPA review lacking where the agency failed to address secondary growth as it pertained to impacts to groundwater, prime farmland, floodplains and stormwater run-off, wetlands and wildlife and vegetation); *Friends of the Earth v. United States Army Corps of Eng'rs*, 109 F. Supp.2d 30, 43 (D.D.C. 2000) (finding NEPA required analysis of inevitable secondary development that would result from casinos, and the agency failed to adequately consider the cumulative impact of casino construction in the area); *see also Mullin v. Skinner*, 756 F. Supp. 904, 925 (E.D.N.C. 1990) (Agency enjoined from proceeding with bridge project which induced growth in island community until it prepared an adequate EIS identifying and discussing in detail the direct, indirect, and cumulative impacts of and alternatives to the proposed Project); *City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential
I-49 that it would create). Among the cumulative impacts to resources that have not been fully analyzed
are impacts to desert tortoise, impacts to sand transport systems and down-wind Mojave fringe-toed
I-50 lizard habitat, impacts to golden eagles, and impacts to water resources. The cumulative impacts to
the resources of the California deserts has not been fully identified or analyzed, and mitigation
measures have not been fully analyzed as well.

G. The EIS' Alternatives Analysis is Inadequate

NEPA requires that an EIS contain a discussion of the "alternatives to the proposed action." 42 U.S.C. §§ 4332(C)(iii),(E). The discussion of alternatives is at "the heart" of the NEPA process, and is intended to provide a "clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. §1502.14; *Idaho Sporting Congress*, 222 F.3d at 567 (compliance with NEPA's procedures "is not an end in itself . . . [but] it is through NEPA's action forcing procedures that the sweeping policy goals announced in § 101 of NEPA are realized.") (internal citations omitted). NEPA's regulations and Ninth Circuit case law require the agency to "rigorously explore" and objectively evaluate "all reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added); *Envtl. Prot. Info. Ctr. v. U.S. Forest Serv.*, 234 Fed. Appx. 440, 442 (9th Cir. 2007). "The purpose of NEPA's alternatives requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Envtl. Defense Fund, Inc. v. U.S. Army Corps of Engrs.*, 492 F.2d 1123, 1135 (5th Cir. 1974). An agency will be found in compliance with NEPA only when "all reasonable alternatives have been considered and an appropriate explanation is provided as to why an alternative was eliminated." *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1246 (9th Cir. 2005); *Bob Marshall Alliance v. Hodel*,

of the Project. The Project proposes to minimize impacts by following existing ROWs that are currently in use, thereby minimizing impacts to desert soils, and by adopting detailed and specific plans for restoration of habitat at temporary disturbance sites (refer to mitigation measure BIO-1 in Table 4.3.1-1 in Chapter 4 of the Final EIS/EIR).

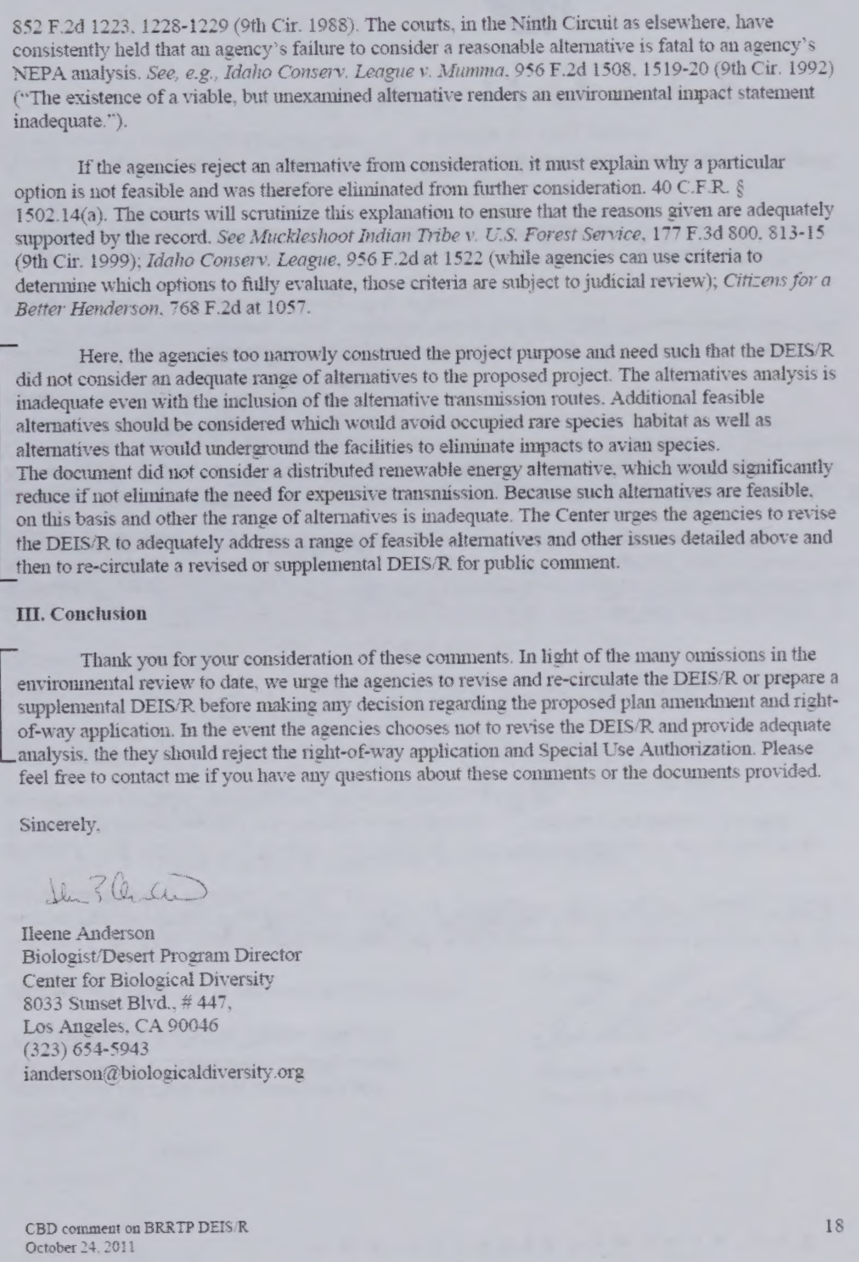
Response I-47: The cumulative impacts of the Project were described in Chapter 5 of the Draft EIS/EIR, including documentation of significant cumulative impacts, and that documentation is adequate for the agencies for this environmental review process. We began compiling the list of present and reasonably foreseeable actions with the scoping process for this Project and completed the list during the final preparations for release of the Draft EIS/EIR (in August 2011). This list includes known renewable energy projects, transmission, and other development projects within the Project area. The list was developed in consultation with a wide range of agencies including: USFS, BLM, United States Air Force – Edwards Air Force Base, Kern County Planning Department, Los Angeles County Planning Department, City of California City, City of Lancaster, City of Palmdale, City of Santa Clarita, City of Los Angeles, City of San Fernando, and LADWP. Additionally, Table 5-1 in the Final EIS/EIR table has been updated to include all projects within the impact area currently under review with the cities, counties, and federal agencies prior to release of the Final EIS/EIR.

Also see Response I-19 above regarding the adequacy of information provided regarding rare plants.

Response I-48: The cumulative impacts of the Project were described in Chapter 5 of the Draft EIS/EIR, including documentation of synergistic effects, and that documentation is adequate for the agencies for this environmental review process. Also, please refer to Response I-47 above.

Response I-49: As explained in Response I-27 above, the cumulative impacts of the Project were described in Chapter 5 of the Draft EIS/EIR, including documentation of significant cumulative impacts, and that documentation is adequate for the agencies for this environmental review and decision-making process. Cumulative impacts to the golden eagle are already incorporated into "Non-listed Special-status Aerial Species" in Section 5.3.2 of the Draft EIS/EIR. The Mojave fringe-toed lizard is not present within the Project area and, therefore, not discussed in the cumulative section. The only species that were specifically analyzed for cumulative effects were those that are listed by the federal Endangered Species Act (ESA) and/or CESA. The discussions of cumulative impacts to desert tortoise and water resources are assumed to be adequate as-is without further clarification (refer to pages 5-75 and 5-102 of the Draft EIS/EIR).

It is assumed that, by "full analysis" of cumulative impacts to water resources, the Center for Biological Diversity means a quantitative analysis of potential cumulative impacts to watershed hydrology. A quantitative cumulative analysis of impacts to water resources within a watershed or region would be speculative in nature, even when drawing upon predicted cumulative impacts of other existing or planned projects in the study area. A quantitative cumulative analysis would necessarily be based upon unknowns, and thus would serve little purpose other than to postulate that multiple impacts occurring at multiple sites within a watershed or planning area would be cumulatively significant, regardless of whether the individual impacts are less than significant. This determination of "cumulatively significant impact" has been stated in the cumulative analysis presented in the Draft EIS/EIR (refer to



852 F.2d 1223, 1228-1229 (9th Cir. 1988). The courts, in the Ninth Circuit as elsewhere, have consistently held that an agency's failure to consider a reasonable alternative is fatal to an agency's NEPA analysis. *See, e.g., Idaho Conserv. League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992) ("The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate.").

If the agencies reject an alternative from consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. § 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record. *See Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999); *Idaho Conserv. League*, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); *Citizens for a Better Henderson*, 768 F.2d at 1057.

I-51 Here, the agencies too narrowly construed the project purpose and need such that the DEIS/R did not consider an adequate range of alternatives to the proposed project. The alternatives analysis is inadequate even with the inclusion of the alternative transmission routes. Additional feasible alternatives should be considered which would avoid occupied rare species habitat as well as alternatives that would underground the facilities to eliminate impacts to avian species. The document did not consider a distributed renewable energy alternative, which would significantly reduce if not eliminate the need for expensive transmission. Because such alternatives are feasible, on this basis and other the range of alternatives is inadequate. The Center urges the agencies to revise the DEIS/R to adequately address a range of feasible alternatives and other issues detailed above and then to re-circulate a revised or supplemental DEIS/R for public comment.

III. Conclusion

I-52 Thank you for your consideration of these comments. In light of the many omissions in the environmental review to date, we urge the agencies to revise and re-circulate the DEIS/R or prepare a supplemental DEIS/R before making any decision regarding the proposed plan amendment and right-of-way application. In the event the agencies chooses not to revise the DEIS/R and provide adequate analysis, the they should reject the right-of-way application and Special Use Authorization. Please feel free to contact me if you have any questions about these comments or the documents provided.

Sincerely,

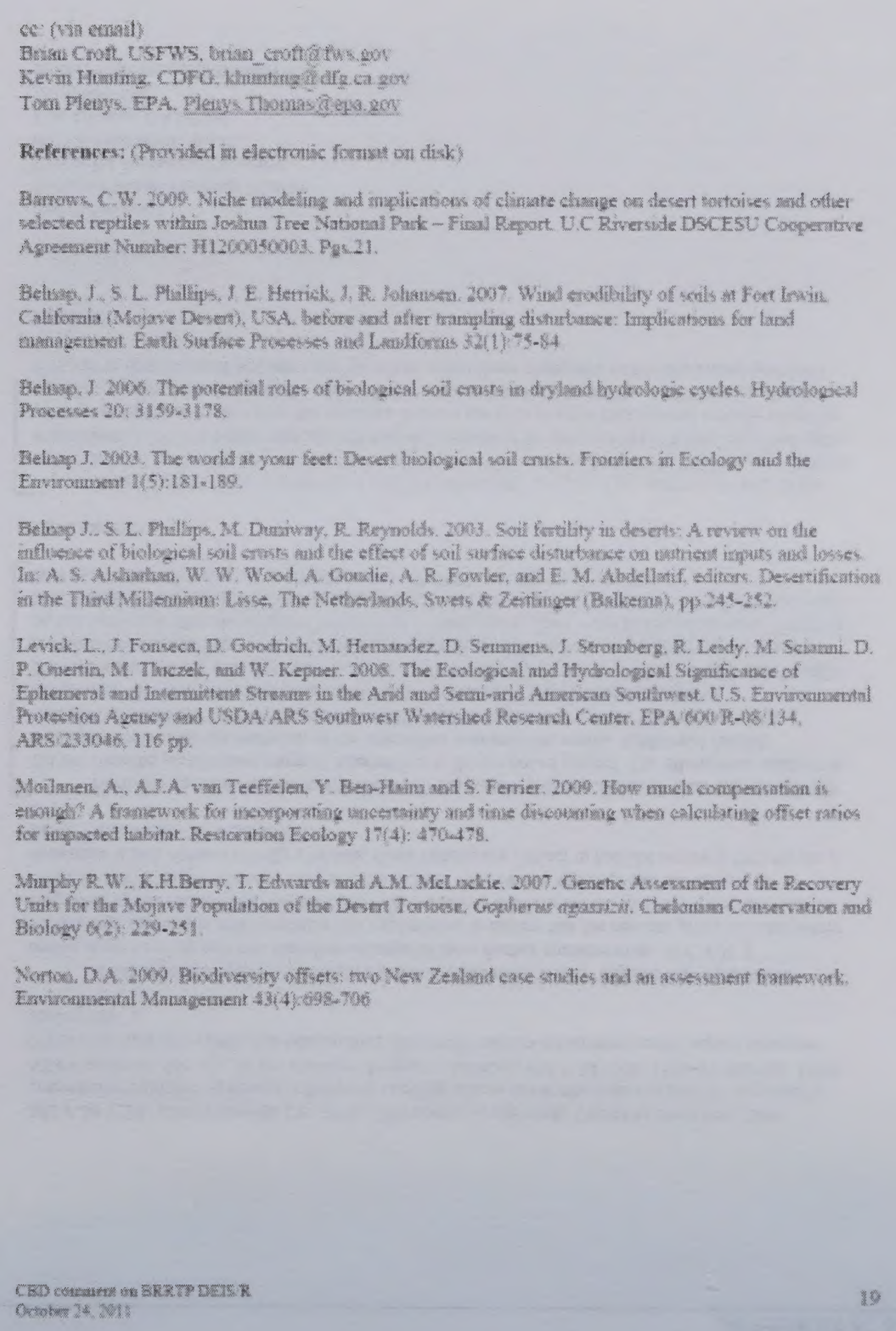
Ileene Anderson
Biologist/Desert Program Director
Center for Biological Diversity
8033 Sunset Blvd., # 447,
Los Angeles, CA 90046
(323) 654-5943
ianderson@biologicaldiversity.org

page 5-100) and in the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR (refer to pages 96 through 97).

Response I-50: The Draft EIS/EIR included best efforts to investigate and disclose environmental information (see CEQA Guidelines § 15144) and used all available resources, including surveys, to determine the baseline information on the resources within the California deserts. This included conducting protocol botanical surveys, vegetation mapping, Joshua tree surveys, and habitat assessment for listed wildlife species that have the potential to occur (refer to pages 3-152 through 3-180 of the Draft EIS/EIR for the inventory results). Impact analyses were conducted and include detailed mitigation measures to protect the resources within the California deserts (refer to pages 4-390 through 4-408 of the Draft EIS/EIR).

Response I-51: A distributed generation alternative was considered but eliminated from detailed analysis in the Draft EIS/EIR because it would not meet the Project purpose and need. Please refer to Response I-17 for additional discussion regarding Project purpose and need, and the range of alternatives considered; and to Response I-2 for further discussion of the distributed generation alternative.

Response I-52: Responses to all comments on the Draft EIS/EIR have been provided, and revisions made, including added analysis and documentation in the Final EIS/EIR. The agencies will complete the environmental review with a decision to select one of the alternatives. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



cc: (via email)
Brian Croft, USFWS, brian_croft@fws.gov
Kevin Hunting, CDFG, khunting@dfg.ca.gov
Tom Plenys, EPA, Plenys.Thomas@epa.gov

References: (Provided in electronic format on disk)

Barrows, C.W. 2009. Niche modeling and implications of climate change on desert tortoises and other selected reptiles within Joshua Tree National Park – Final Report. U.C Riverside DSCESU Cooperative Agreement Number: H1200050003. Pgs.21.

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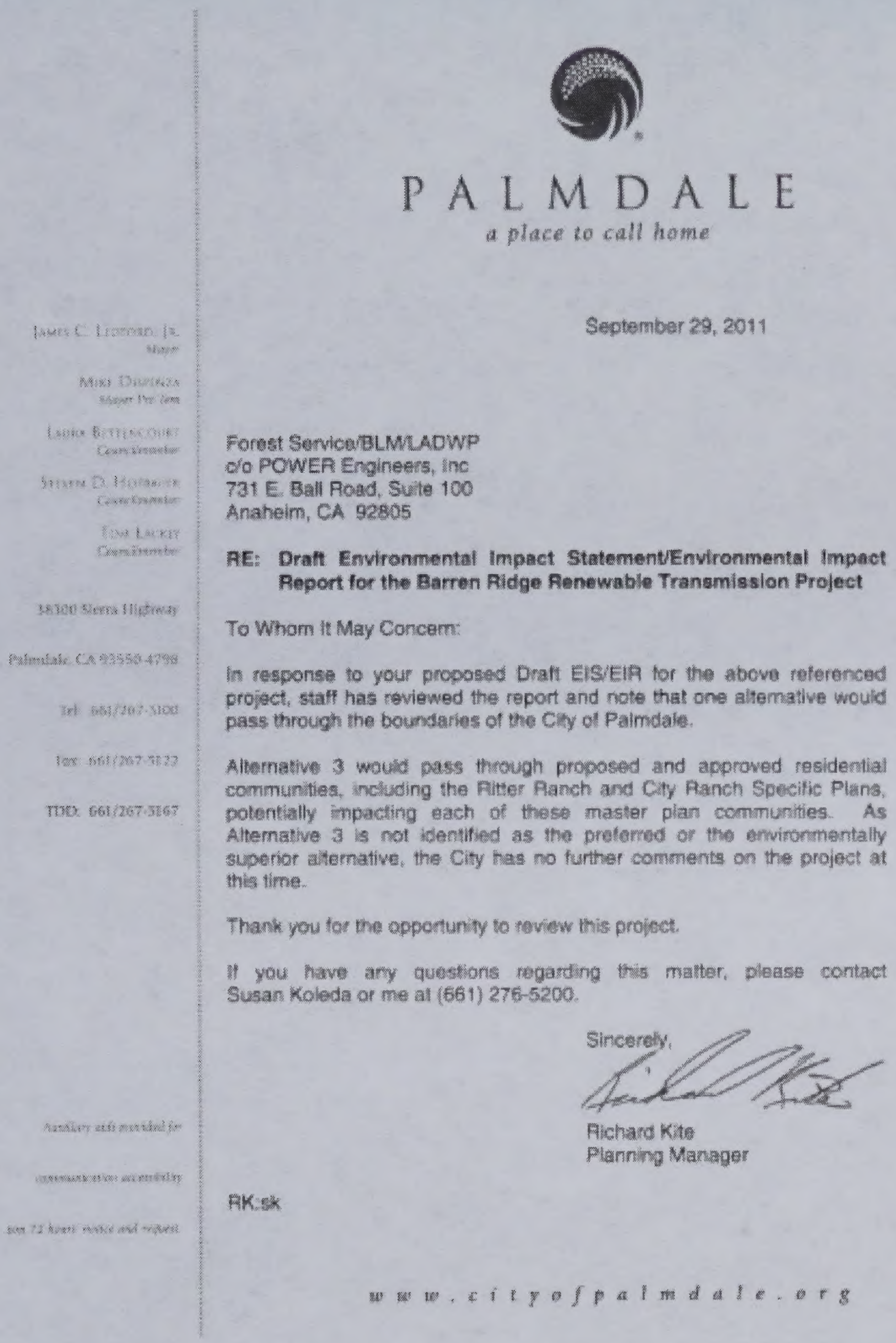

PALMDALE
a place to call home

September 29, 2011

James C. Ledford, Jr.
Mayor

Mike Dispenza
Mayor Pro Tem

Laura Bettencourt
Councilmember

Steven D. Hofbauer
Councilmember

Tom Lackey
Councilmember

38300 Sierra Highway

Palmdale, CA 93550-4798

Tel: 661/267-5100

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TDD: 661/267-5167

Forest Service/BLM/LADWP
c/o POWER Engineers, Inc
731 E. Ball Road, Suite 100
Anaheim, CA 92805

RE: Draft Environmental Impact Statement/Environmental Impact Report for the Barren Ridge Renewable Transmission Project

To Whom It May Concern:

In response to your proposed Draft EIS/EIR for the above referenced project, staff has reviewed the report and note that one alternative would pass through the boundaries of the City of Palmdale.

Alternative 3 would pass through proposed and approved residential communities, including the Ritter Ranch and City Ranch Specific Plans, potentially impacting each of these master plan communities. As Alternative 3 is not identified as the preferred or the environmentally superior alternative, the City has no further comments on the project at this time.

Thank you for the opportunity to review this project.

If you have any questions regarding this matter, please contact Susan Koleda or me at (661) 276-5200.

Sincerely,

Richard Kite
Richard Kite
Planning Manager

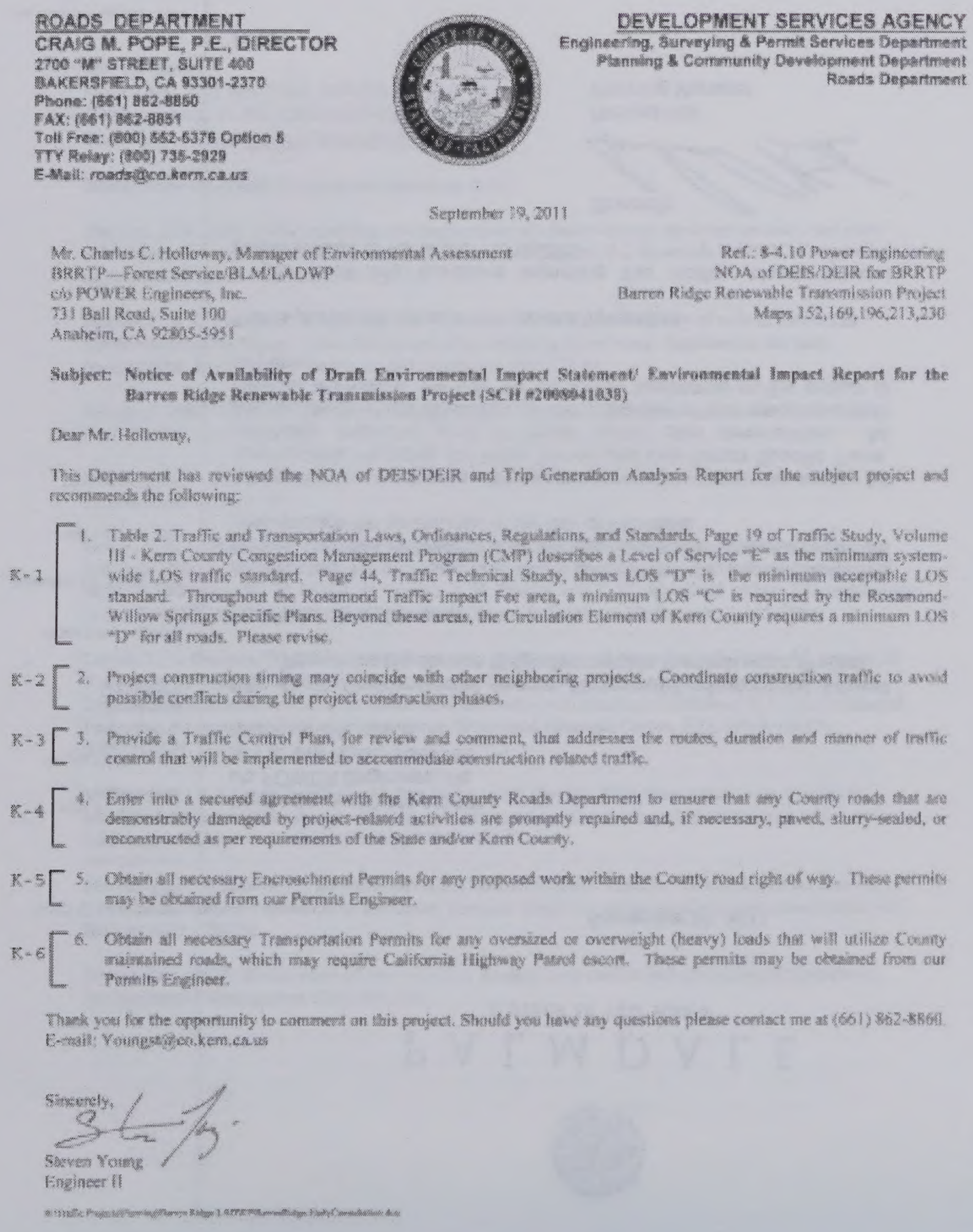
RK:sk

Auxiliary aids provided for communication accessibility upon 72 hours' notice and request.

www.cityofpalmdale.org

LETTER J: CITY OF PALMDALE

Response J-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



ROADS DEPARTMENT
CRAIG M. POPE, P.E., DIRECTOR
2700 "M" STREET, SUITE 400
BAKERSFIELD, CA 93301-2370
Phone: (661) 862-8850
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E-Mail: roads@co.kern.ca.us

DEVELOPMENT SERVICES AGENCY
Engineering, Surveying & Permit Services Department
Planning & Community Development Department
Roads Department

September 19, 2011

Mr. Charles C. Holloway, Manager of Environmental Assessment
BRRTP—Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805-5951

Ref.: 8-4.10 Power Engineering
NOA of DEIS/DEIR for BRRTP
Barren Ridge Renewable Transmission Project
Maps 152,169,196,213,230

Subject: Notice of Availability of Draft Environmental Impact Statement/ Environmental Impact Report for the Barren Ridge Renewable Transmission Project (SCH #2009041038)

Dear Mr. Holloway,

This Department has reviewed the NOA of DEIS/DEIR and Trip Generation Analysis Report for the subject project and recommends the following:

K-1 1. Table 2. Traffic and Transportation Laws, Ordinances, Regulations, and Standards, Page 19 of Traffic Study, Volume III - Kern County Congestion Management Program (CMP) describes a Level of Service "E" as the minimum system-wide LOS traffic standard. Page 44, Traffic Technical Study, shows LOS "D" is the minimum acceptable LOS standard. Throughout the Rosamond Traffic Impact Fee area, a minimum LOS "C" is required by the Rosamond-Willow Springs Specific Plans. Beyond these areas, the Circulation Element of Kern County requires a minimum LOS "D" for all roads. Please revise.

K-2 2. Project construction timing may coincide with other neighboring projects. Coordinate construction traffic to avoid possible conflicts during the project construction phases.

K-3 3. Provide a Traffic Control Plan, for review and comment, that addresses the routes, duration and manner of traffic control that will be implemented to accommodate construction related traffic.

K-4 4. Enter into a secured agreement with the Kern County Roads Department to ensure that any County roads that are demonstrably damaged by project-related activities are promptly repaired and, if necessary, paved, slurry-sealed, or reconstructed as per requirements of the State and/or Kern County.

K-5 5. Obtain all necessary Encroachment Permits for any proposed work within the County road right of way. These permits may be obtained from our Permits Engineer.

K-6 6. Obtain all necessary Transportation Permits for any oversized or overweight (heavy) loads that will utilize County maintained roads, which may require California Highway Patrol escort. These permits may be obtained from our Permits Engineer.

Thank you for the opportunity to comment on this project. Should you have any questions please contact me at (661) 862-8860.
E-mail: Youngst@co.kern.ca.us

Sincerely,

Steven Young
Engineer II

LETTER K: COUNTY OF KERN ROADS DEPARTMENT

Response K-1: Table D-14 of Appendix D of the Final EIS/EIR has been revised to show the correct level of service standards per Kern County's General Plan Circulation Element.

Response K-2: A Traffic Control Plan is identified as a General Practice (GP-2) in Chapter 2, Table 2-8, page 2-87 of the Final EIS/EIR that would be implemented after consultation with transportation agencies, including Kern County. This plan would be coordinated with Kern County, other jurisdictions, and local communities to address Project construction timing with other neighboring projects.

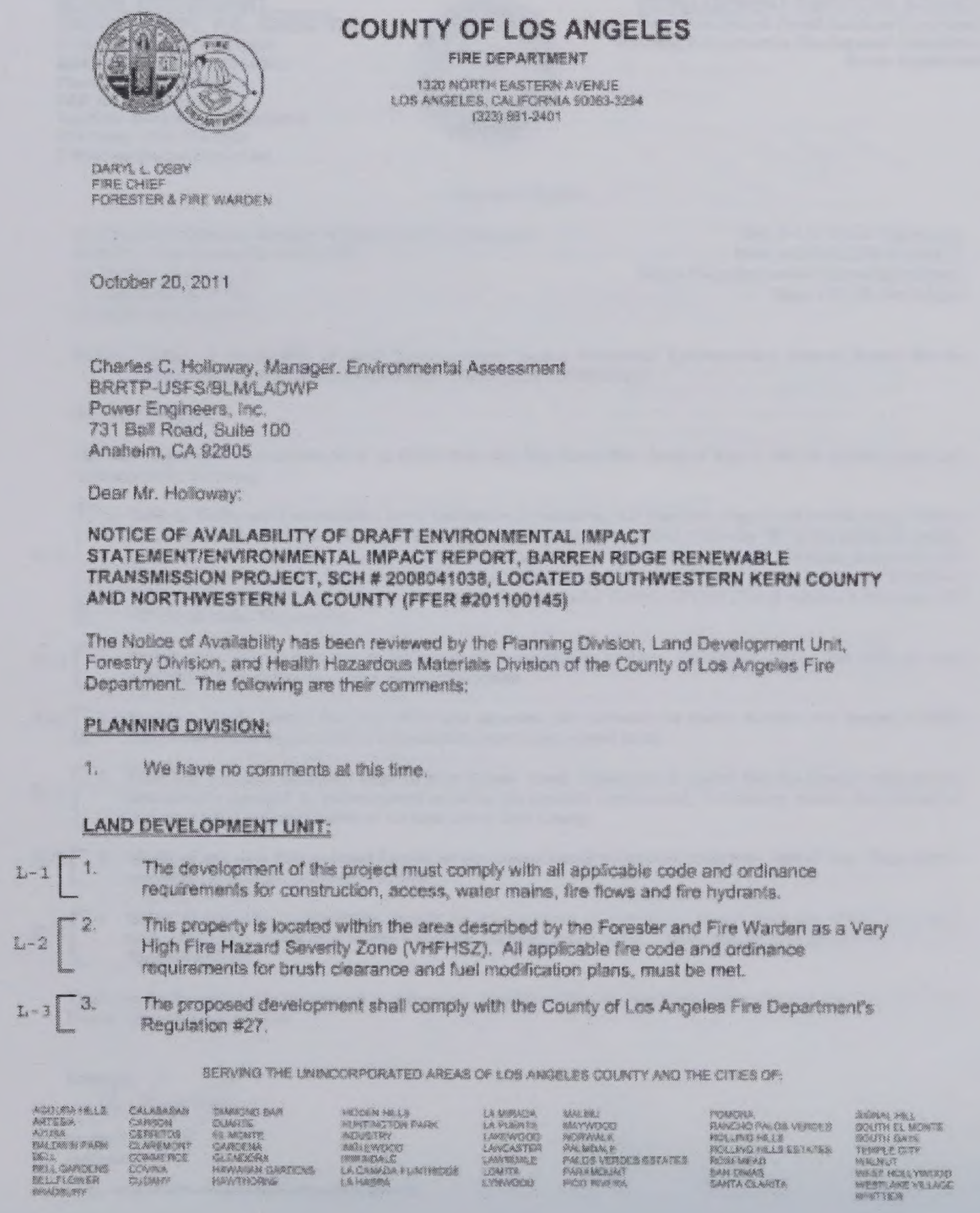
Response K-3: If one of the action alternatives is selected, a Traffic Control Plan, identified as a General Practice GP-2, (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR) would be prepared and submitted to all agencies with jurisdiction over public roads directly affected by construction activities.

Response K-4: The repair of roads damaged by Project-related activities is identified as General Practice GP-32 (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR). Because this General Practice would be implemented if one of the action alternatives is selected in the decision process, no specific agreement with Kern County is necessary.

Response K-5: Table D-14 in Appendix D of the Final EIS/EIR has been revised to include county ROW as requiring an encroachment permit.

Response K-6: Table D-14 in Appendix D of the Final EIS/EIR has been revised to show that permits for overweight/oversized loads must be obtained from the Permits Engineer.

LETTER L: COUNTY OF LOS ANGELES FIRE DEPARTMENT



COUNTY OF LOS ANGELES
FIRE DEPARTMENT
1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294
(323) 881-2401

DARYL L. OSBY
FIRE CHIEF
FORESTER & FIRE WARDEN

October 20, 2011

Charles C. Holloway, Manager. Environmental Assessment
BRRTP-USFS/BLM/LADWP
Power Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Dear Mr. Holloway:

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT, BARREN RIDGE RENEWABLE TRANSMISSION PROJECT, SCH # 2008041038, LOCATED SOUTHWESTERN KERN COUNTY AND NORTHWESTERN LA COUNTY (FFER #201100145)

The Notice of Availability has been reviewed by the Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION:

1. We have no comments at this time.

LAND DEVELOPMENT UNIT:

L-1 1. The development of this project must comply with all applicable code and ordinance requirements for construction, access, water mains, fire flows and fire hydrants.

L-2 2. This property is located within the area described by the Forester and Fire Warden as a Very High Fire Hazard Severity Zone (VHFHSZ). All applicable fire code and ordinance requirements for brush clearance and fuel modification plans, must be met.

L-3 3. The proposed development shall comply with the County of Los Angeles Fire Department's Regulation #27.

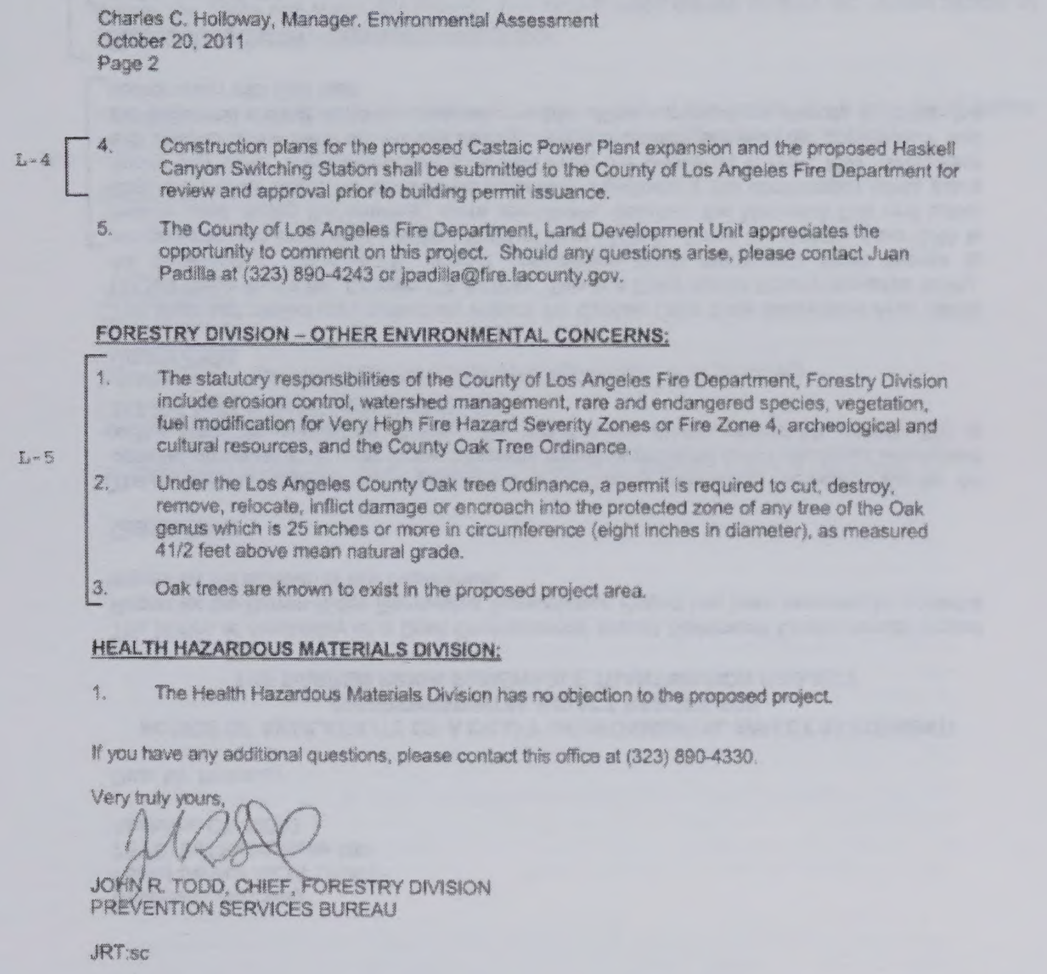
SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

AGOURA HILLS
ARTESIA
AZUSA
BALDWIN PARK
BELL
BELL GARDENS
BELLFLOWER
BRADBURY
CALABASAS
CARSON
CERRITOS
CLAREMONT
COMMERCE
COVINA
CUDAHY
DIAMOND BAR
DUARTE
EL MONTE
GARDENA
GLENDORA
HAWAIIAN GARDENS
HAWTHORNE
HIDDEN HILLS
HUNTINGTON PARK
INDUSTRY
INGLEWOOD
IRWINDALE
LA CANADA FLINTRIDGE
LA HABRA
LA MIRADA
LA PUENTE
LAKEWOOD
LANCASTER
LAWNDALE
LOMITA
LYNWOOD
MALIBU
MAYWOOD
NORWALK
PALMDALE
PALOS VERDES ESTATES
PARAMOUNT
PICO RIVERA
POMONA
RANCHO PALOS VERDES
ROLLING HILLS
ROLLING HILLS ESTATES
ROSEMEAD
SAN DIMAS
SANTA CLARITA
SIGNAL HILL
SOUTH EL MONTE
SOUTH GATE
TEMPLE CITY
WALNUT
WEST HOLLYWOOD
WESTLAKE VILLAGE
WHITTIER

Response L-1: As stated in Section 1.4 in Chapter 1 of the Final EIS/EIR, BRRTP would conform to all relevant federal, State, and local statutes, regulations and plans. Code and ordinance requirements must be met during construction if one of the action alternatives is selected in the decision process.

Response L-2: Refer to Response L-1. All fire code and ordinance requirements must be met during construction if one of the action alternatives is selected in the decision process

Response L-3: Refer to Response L-1. Regulation #27 would be met during construction if one of the action alternatives is selected in the decision process.



Charles C. Holloway, Manager, Environmental Assessment
October 20, 2011
Page 2

L-4
4. Construction plans for the proposed Castaic Power Plant expansion and the proposed Haskell Canyon Switching Station shall be submitted to the County of Los Angeles Fire Department for review and approval prior to building permit issuance.

5. The County of Los Angeles Fire Department, Land Development Unit appreciates the opportunity to comment on this project. Should any questions arise, please contact Juan Padilla at (323) 890-4243 or jpadilla@fire.lacounty.gov.

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

L-5
1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance.

2. Under the Los Angeles County Oak tree Ordinance, a permit is required to cut, destroy, remove, relocate, inflict damage or encroach into the protected zone of any tree of the Oak genus which is 25 inches or more in circumference (eight inches in diameter), as measured 41/2 feet above mean natural grade.

3. Oak trees are known to exist in the proposed project area.

HEALTH HAZARDOUS MATERIALS DIVISION:

1. The Health Hazardous Materials Division has no objection to the proposed project.

If you have any additional questions, please contact this office at (323) 890-4330.

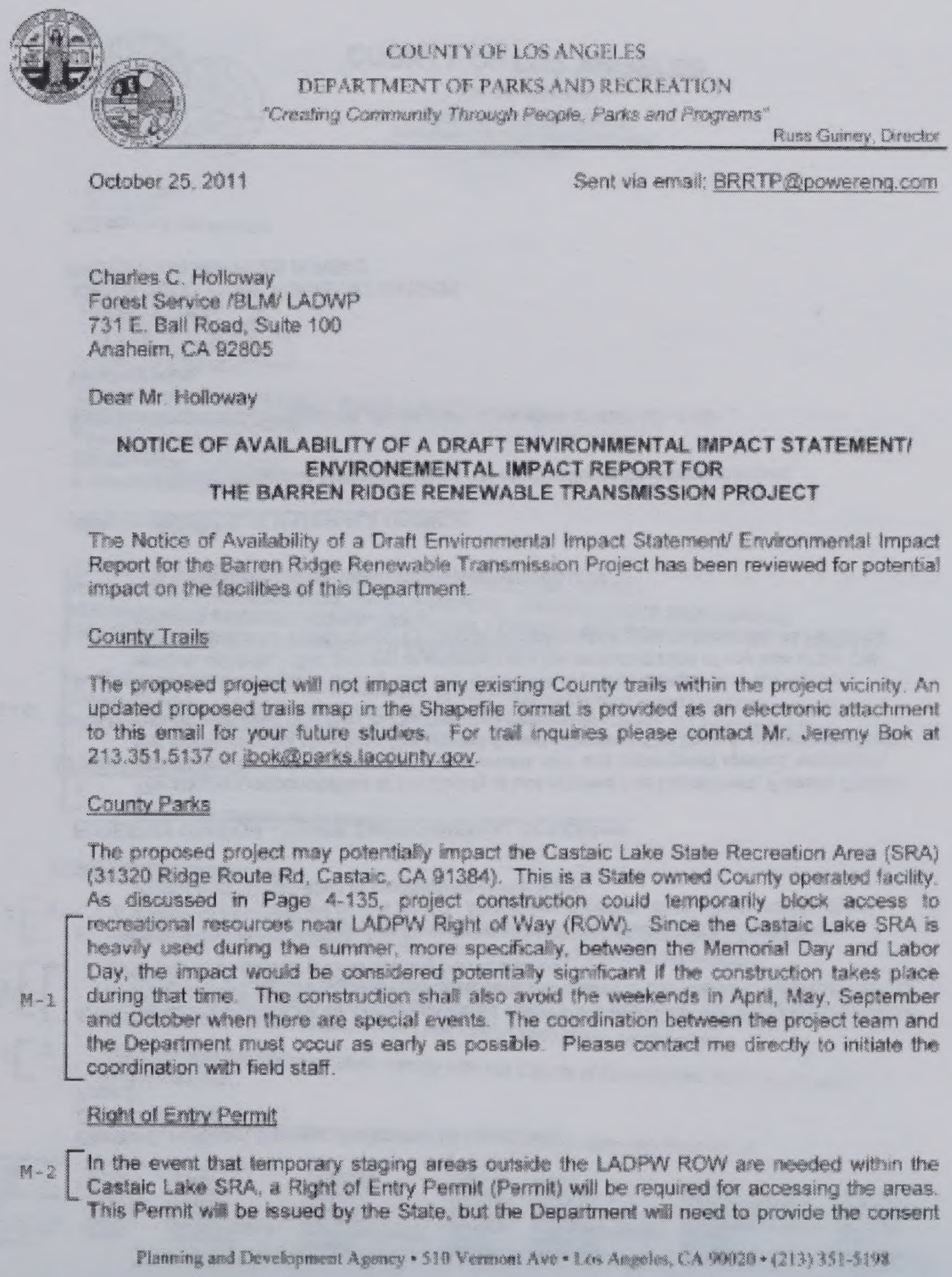
Very truly yours,

JOHN R. TODD, CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

JRT:sc

Response L-4: The building proposed at the Haskell Canyon Switching Station is planned to be unmanned. If there are any offices involved in the Project, or the building will house human occupants, then a building permit will be acquired for safety reasons. Application of a building permit will automatically trigger fire department review. No expansion of the Castaic Power Plant is proposed as part of BRRTP.

Response L-5: Refer to Response L-1. Additionally, Mitigation Measure BIO-13 (refer to Table 4.3.1-1 in Chapter 4 of the Final EIS/EIR) requires the protection of sensitive plant species and their habitat, including oak trees. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



COUNTY OF LOS ANGELES
DEPARTMENT OF PARKS AND RECREATION
"Creating Community Through People, Parks and Programs"
Russ Guiney, Director

October 25, 2011

Sent via email: BRRTP@powereng.com

Charles C. Holloway
Forest Service /BLM/ LADWP
731 E. Ball Road, Suite 100
Anaheim, CA 92805

Dear Mr. Holloway

NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONEMENTAL IMPACT REPORT FOR THE BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

The Notice of Availability of a Draft Environmental Impact Statement/ Environmental Impact Report for the Barren Ridge Renewable Transmission Project has been reviewed for potential impact on the facilities of this Department.

County Trails

The proposed project will not impact any existing County trails within the project vicinity. An updated proposed trails map in the Shapefile format is provided as an electronic attachment to this email for your future studies. For trail inquiries please contact Mr. Jeremy Bok at 213.351.5137 or jbok@parks.lacounty.gov.

County Parks

The proposed project may potentially impact the Castaic Lake State Recreation Area (SRA) (31320 Ridge Route Rd, Castaic, CA 91384). This is a State owned County operated facility. As discussed in Page 4-135, project construction could temporarily block access to recreational resources near LADPW Right of Way (ROW). Since the Castaic Lake SRA is heavily used during the summer, more specifically, between the Memorial Day and Labor Day, the impact would be considered potentially significant if the construction takes place during that time. The construction shall also avoid the weekends in April, May, September and October when there are special events. The coordination between the project team and the Department must occur as early as possible. Please contact me directly to initiate the coordination with field staff. M-1

Right of Entry Permit

M-2 In the event that temporary staging areas outside the LADPW ROW are needed within the Castaic Lake SRA, a Right of Entry Permit (Permit) will be required for accessing the areas. This Permit will be issued by the State, but the Department will need to provide the consent

Planning and Development Agency • 510 Vermont Ave • Los Angeles, CA 90020 • (213) 351-5198

LETTER M: COUNTY OF LA PARKS AND RECREATION

Response M-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. As discussed in Chapter 4, Section 4.2.5, Recreation, pages 4-143 and 4-144 of the Draft EIS/EIR, access disruptions could occur during construction activities within the Castaic Lake State Recreation Area (CLSA). Mitigation measures R-1a (Coordinate construction schedule and maintenance activities with managing officer(s) for affected recreation areas) and R-1b (Identify and provide noticing of alternative recreation areas) would be implemented to minimize impacts to the CLSA. Coordination between LADWP and the County of Los Angeles Department of Parks and Recreation will occur as early as possible.

Response M-2: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. In the event a temporary staging area is required outside the existing LADWP ROW within the Castaic Lake State Recreation Area, a Right of Entry Permit would be obtained by the State with the consent of the County of Los Angeles Department of Parks and Recreation.

before the State can issue the Permit. For coordination please contact Mr. James Barber at 213.351.5117 or jbarber@parks.lacounty.gov.

Thank you for including this Department in the review of this notice. If we may be of further assistance, please contact me at (213) 351-5129 or jchien@parks.lacounty.gov.

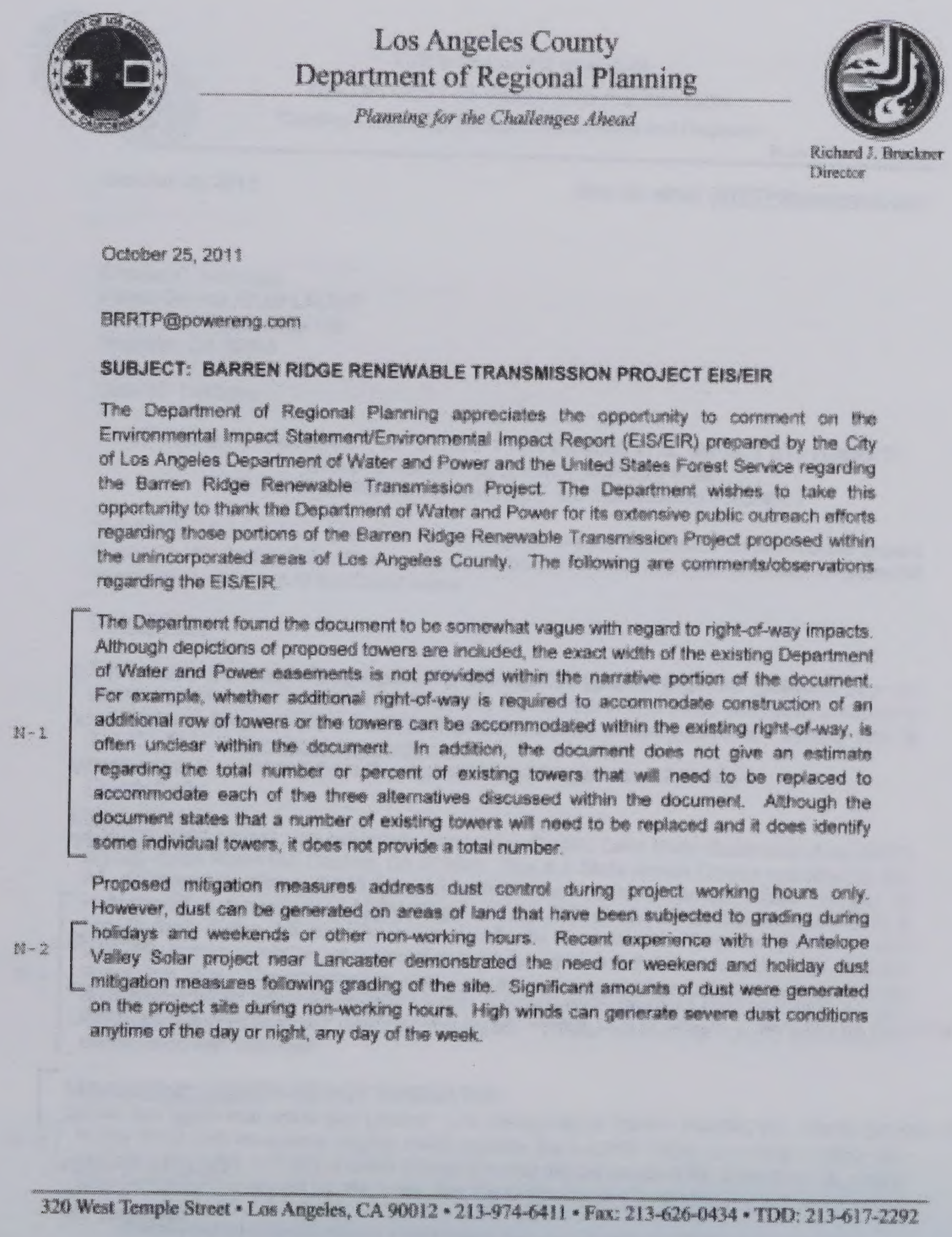
Sincerely,

Jui Ing Chien
Park Planner

Attachment: 1. Proposed County Trails Map (Shapefile, sent by email)

JC:lls/Response to Barren Ridge Transmission Project NOA

C: Parks and Recreation (N.E. Garcia, L. Hensley, J. Barber, J. Bok, L. Bennett)



Los Angeles County
Department of Regional Planning
Planning for the Challenges Ahead

Richard J. Bruckner
Director

October 25, 2011

BRRTP@powereng.com

SUBJECT: BARREN RIDGE RENEWABLE TRANSMISSION PROJECT EIS/EIR

The Department of Regional Planning appreciates the opportunity to comment on the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) prepared by the City of Los Angeles Department of Water and Power and the United States Forest Service regarding the Barren Ridge Renewable Transmission Project. The Department wishes to take this opportunity to thank the Department of Water and Power for its extensive public outreach efforts regarding those portions of the Barren Ridge Renewable Transmission Project proposed within the unincorporated areas of Los Angeles County. The following are comments/observations regarding the EIS/EIR.

N-1 The Department found the document to be somewhat vague with regard to right-of-way impacts. Although depictions of proposed towers are included, the exact width of the existing Department of Water and Power easements is not provided within the narrative portion of the document. For example, whether additional right-of-way is required to accommodate construction of an additional row of towers or the towers can be accommodated within the existing right-of-way, is often unclear within the document. In addition, the document does not give an estimate regarding the total number or percent of existing towers that will need to be replaced to accommodate each of the three alternatives discussed within the document. Although the document states that a number of existing towers will need to be replaced and it does identify some individual towers, it does not provide a total number.

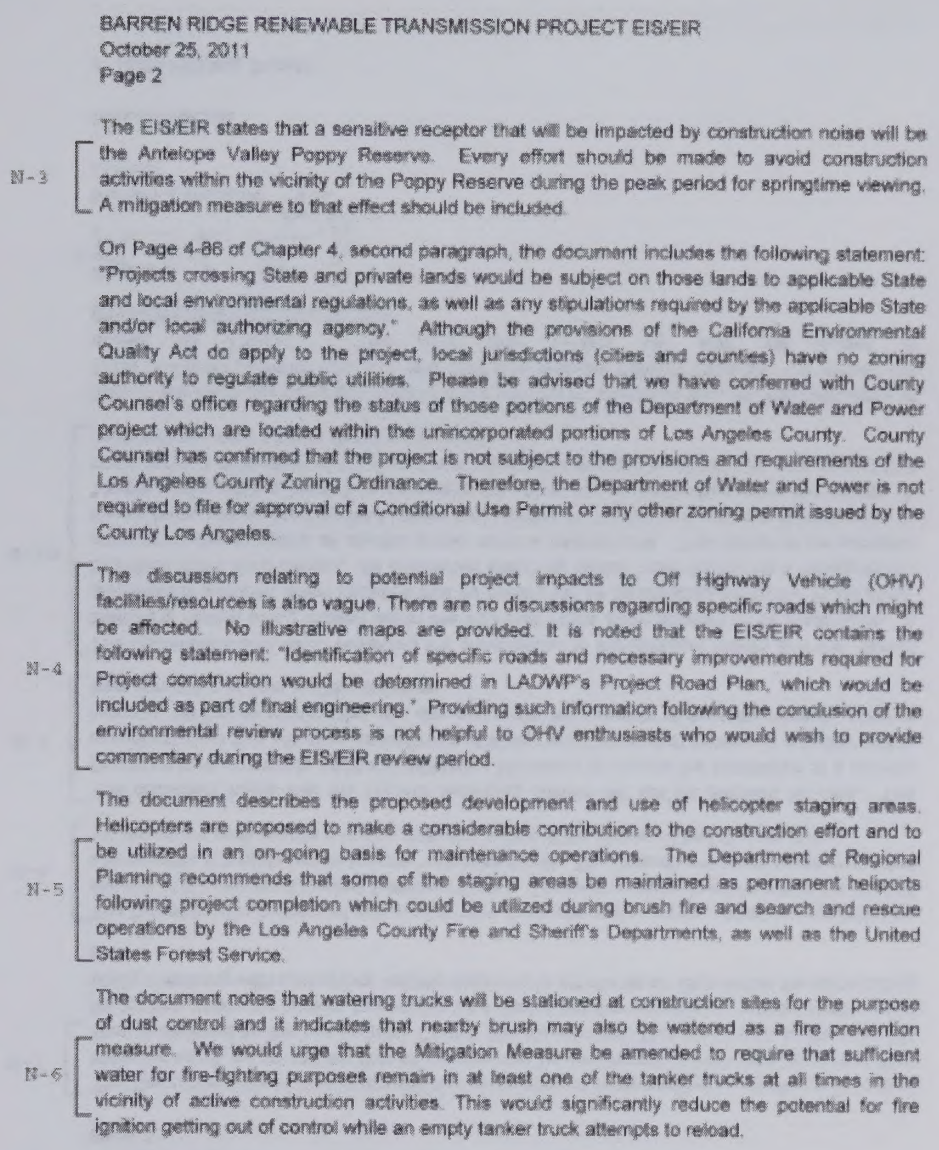
N-2 Proposed mitigation measures address dust control during project working hours only. However, dust can be generated on areas of land that have been subjected to grading during holidays and weekends or other non-working hours. Recent experience with the Antelope Valley Solar project near Lancaster demonstrated the need for weekend and holiday dust mitigation measures following grading of the site. Significant amounts of dust were generated on the project site during non-working hours. High winds can generate severe dust conditions anytime of the day or night, any day of the week.

320 West Temple Street • Los Angeles, CA 90012 • 213-974-6411 • Fax: 213-626-0434 • TDD: 213-617-2292

LETTER N: COUNTY OF LOS ANGELES DEPARTMENT OF REGIONAL PLANNING

Response N-1: The potential ROW impacts of the proposed Project are discussed and described throughout the Draft EIS/EIR. While the specific width of existing ROW was not provided within the narrative of the Draft EIS/EIR, this information has been added to the Final EIS/EIR as Table ROW-1 on page 2-97 in Chapter 2 of the Final EIS/EIR. For all action Alternatives, the new 230 kV double-circuit transmission line would require a new 200-foot-wide ROW, except in areas where the proposed line would be installed on existing four-circuit towers within existing ROW or in areas where the Three-Circuit Mitigation would be applied. The Three-Circuit Mitigation would involve placing the new line and the existing AC line on new three-circuit towers, within an existing ROW or within a new 125-foot ROW. The width of new ROW required for the new double-circuit transmission line is described in the Final EIS/EIR in Chapter 2 on page 2-57 through 2-59. The Three-Circuit Mitigation is described in Section 2.4.3 of the Final EIS/EIR, and the specific locations for the three-circuit towers, within existing and new ROW, are indicated on Figure 2-17 on page 2-80 of the Final EIS/EIR. The proposed reconductoring and the addition of the new 230 kV circuit on existing towers would occur within existing ROW as indicated on pages 2-53 and 2-57 of the Final EIS/EIR, respectively.

An estimate of the total number or percent of existing towers that would need to be replaced within existing ROW was not provided in the Draft EIS/EIR because that number is not known at this time. The reconductoring of the existing 230 kV transmission line would require some structures to be replaced because they may not be structurally adequate to accommodate the new, heavier conductor. While LADWP would not know the exact number of



BARREN RIDGE RENEWABLE TRANSMISSION PROJECT EIS/EIR
October 25, 2011
Page 2

N-3 The EIS/EIR states that a sensitive receptor that will be impacted by construction noise will be the Antelope Valley Poppy Reserve. Every effort should be made to avoid construction activities within the vicinity of the Poppy Reserve during the peak period for springtime viewing. A mitigation measure to that effect should be included.

On Page 4-86 of Chapter 4, second paragraph, the document includes the following statement: "Projects crossing State and private lands would be subject on those lands to applicable State and local environmental regulations, as well as any stipulations required by the applicable State and/or local authorizing agency." Although the provisions of the California Environmental Quality Act do apply to the project, local jurisdictions (cities and counties) have no zoning authority to regulate public utilities. Please be advised that we have conferred with County Counsel's office regarding the status of those portions of the Department of Water and Power project which are located within the unincorporated portions of Los Angeles County. County Counsel has confirmed that the project is not subject to the provisions and requirements of the Los Angeles County Zoning Ordinance. Therefore, the Department of Water and Power is not required to file for approval of a Conditional Use Permit or any other zoning permit issued by the County Los Angeles.

N-4 The discussion relating to potential project impacts to Off Highway Vehicle (OHV) facilities/resources is also vague. There are no discussions regarding specific roads which might be affected. No illustrative maps are provided. It is noted that the EIS/EIR contains the following statement: "Identification of specific roads and necessary improvements required for Project construction would be determined in LADWP's Project Road Plan, which would be included as part of final engineering." Providing such information following the conclusion of the environmental review process is not helpful to OHV enthusiasts who would wish to provide commentary during the EIS/EIR review period.

The document describes the proposed development and use of helicopter staging areas. Helicopters are proposed to make a considerable contribution to the construction effort and to N-5 be utilized in an on-going basis for maintenance operations. The Department of Regional Planning recommends that some of the staging areas be maintained as permanent heliports following project completion which could be utilized during brush fire and search and rescue operations by the Los Angeles County Fire and Sheriff's Departments, as well as the United States Forest Service.

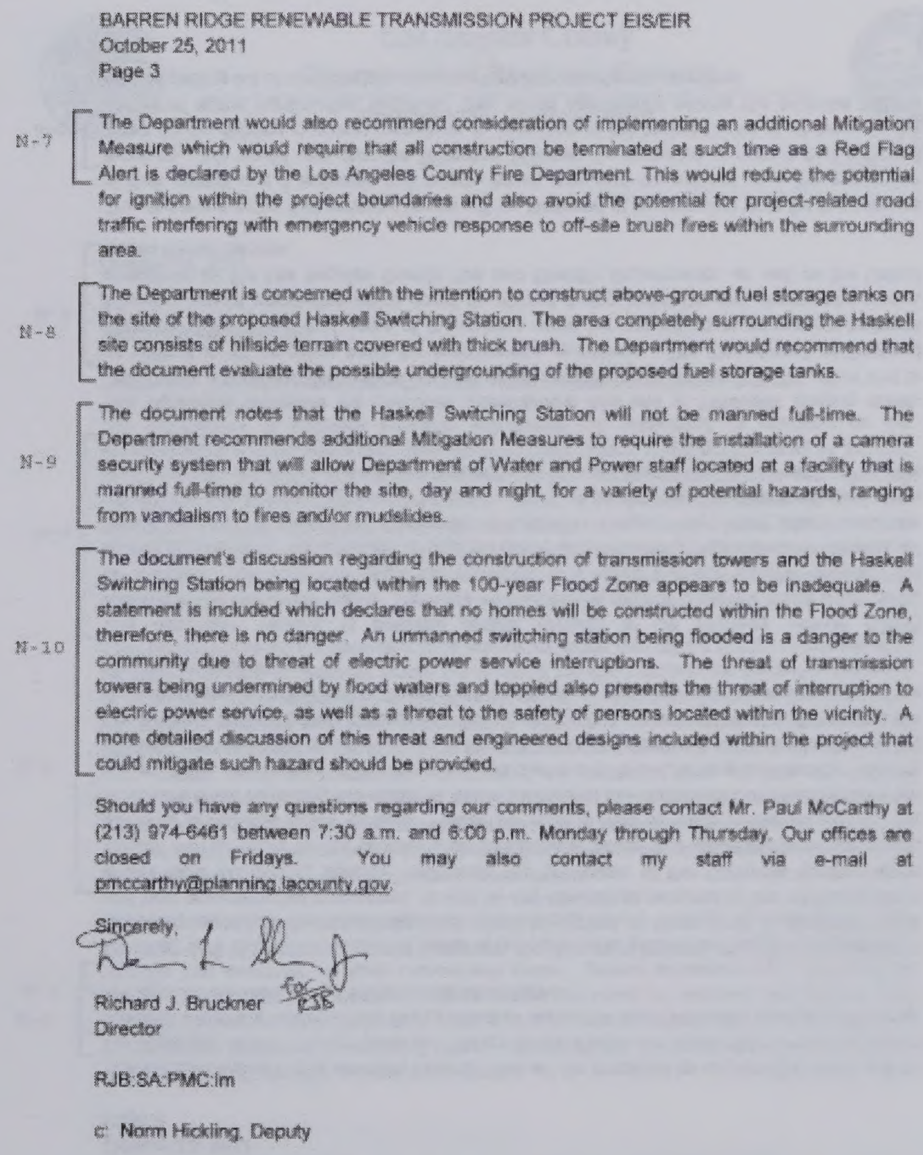
The document notes that watering trucks will be stationed at construction sites for the purpose of dust control and it indicates that nearby brush may also be watered as a fire prevention N-6 measure. We would urge that the Mitigation Measure be amended to require that sufficient water for fire-fighting purposes remain in at least one of the tanker trucks at all times in the vicinity of active construction activities. This would significantly reduce the potential for fire ignition getting out of control while an empty tanker truck attempts to reload.

structures that would need to be replaced until later in the design process, it is clear that the reconductoring would have the same impacts and the same number of structures replaced under any of the action Alternatives. See page 2-53 of the Final EIS/EIR.

Response N-2: As stated on page 4-10 of the Final EIS/EIR (Air Quality, Section 4.2.1), mitigation measure AIR-2a requires the construction contractor to develop a Fugitive Dust Emission Control Plan. Mitigation measure AIR-2a includes measures such as using non-toxic soil binders, watering, and revegetation of inactive areas to the extent practicable to reduce fugitive dust generation, which will reduce dust generated during inactive periods. If dust is noted during inactive periods, LADWP will consider the implementation of additional measures.

Response N-3: LADWP would, through coordination with California State Parks, avoid construction during the most significant peak spring viewing of the Antelope Valley Poppy Reserve area if Alternative 2, 2a, or 3 is selected in the decision process, to the greatest extent feasible. Mitigation measures R-1a (Coordinate construction schedule and maintenance activities with managing officer(s) for affected recreation areas) would be implemented to minimize impacts to the Antelope Valley Poppy Reserve (refer to Table 4.2.5-1 in Chapter 4 of the Final EIS/EIR). Additional mitigation is not necessary.

Response N-4: Off Highway Vehicle (OHV) facilities/resources potentially affected by the Proposed Action and Alternatives are identified in Chapter 4, Section 4.2.5, Recreation, Table 4.2.5-3, Table 4.2.5-4, Table 4.2.5-5, and Table 4.2.5-6 of the Final EIS/EIR. These trails (identified by agency only) are also identified on the Parks, Recreation, and Preservation Map (February 15, 2011) located in the Maps Volume, Volume V, of the Final EIS/EIR.



BARREN RIDGE RENEWABLE TRANSMISSION PROJECT EIS/EIR
October 25, 2011
Page 3

N-7 The Department would also recommend consideration of implementing an additional Mitigation Measure which would require that all construction be terminated at such time as a Red Flag Alert is declared by the Los Angeles County Fire Department. This would reduce the potential for ignition within the project boundaries and also avoid the potential for project-related road traffic interfering with emergency vehicle response to off-site brush fires within the surrounding area.

N-8 The Department is concerned with the intention to construct above-ground fuel storage tanks on the site of the proposed Haskell Switching Station. The area completely surrounding the Haskell site consists of hillside terrain covered with thick brush. The Department would recommend that the document evaluate the possible undergrounding of the proposed fuel storage tanks.

N-9 The document notes that the Haskell Switching Station will not be manned full-time. The Department recommends additional Mitigation Measures to require the installation of a camera security system that will allow Department of Water and Power staff located at a facility that is manned full-time to monitor the site, day and night, for a variety of potential hazards, ranging from vandalism to fires and/or mudslides.

N-10 The document's discussion regarding the construction of transmission towers and the Haskell Switching Station being located within the 100-year Flood Zone appears to be inadequate. A statement is included which declares that no homes will be constructed within the Flood Zone, therefore, there is no danger. An unmanned switching station being flooded is a danger to the community due to threat of electric power service interruptions. The threat of transmission towers being undermined by flood waters and toppled also presents the threat of interruption to electric power service, as well as a threat to the safety of persons located within the vicinity. A more detailed discussion of this threat and engineered designs included within the project that could mitigate such hazard should be provided.

Should you have any questions regarding our comments, please contact Mr. Paul McCarthy at (213) 974-6461 between 7:30 a.m. and 6:00 p.m. Monday through Thursday. Our offices are closed on Fridays. You may also contact my staff via e-mail at pmccarthy@planning.lacounty.gov.

Sincerely,

Richard J. Bruckner for RJB
Director

RJB:SA:PMC:lm

c: Norm Hickling, Deputy

Response N-5: Many of the staging areas would be on private land, and as such would not be able to serve as a heliport for firefighting without permission for such use by the landowner. However, any National Forest System lands used for staging may be considered for a more permanent use in firefighting as you have requested.

Response N-6: Mitigation measure F-2a requires the development of a Construction and Maintenance Fire Control Plan, which would include the requirements of the ANF Fire Management Plan and Title 14 of the California Code of Regulations, Article 8, #918 "Fire Protection." Based on these requirements, the plan would include procedures for reporting fires, minimum fire suppression equipment requirements, communication, construction restrictions based on fire conditions, fire patrols, and fire suppression water supplies. These guidelines are adequate to ensure that water would be available for fire suppression if necessary, and no further mitigation is required.

Response N-7: Per the requirements of mitigation measure F-2b, during Red Flag Warning events, as issued daily by the National Weather Service in Federal Responsibility Areas (FRAs) and Local Responsibility Areas (LRAs), all non-emergency construction and maintenance activities would cease in affected areas. This mitigation measure has been revised to include the Red Flag Warnings issued by the Los Angeles County Fire Department. Refer to page 4-280 of the Final EIS/EIR.

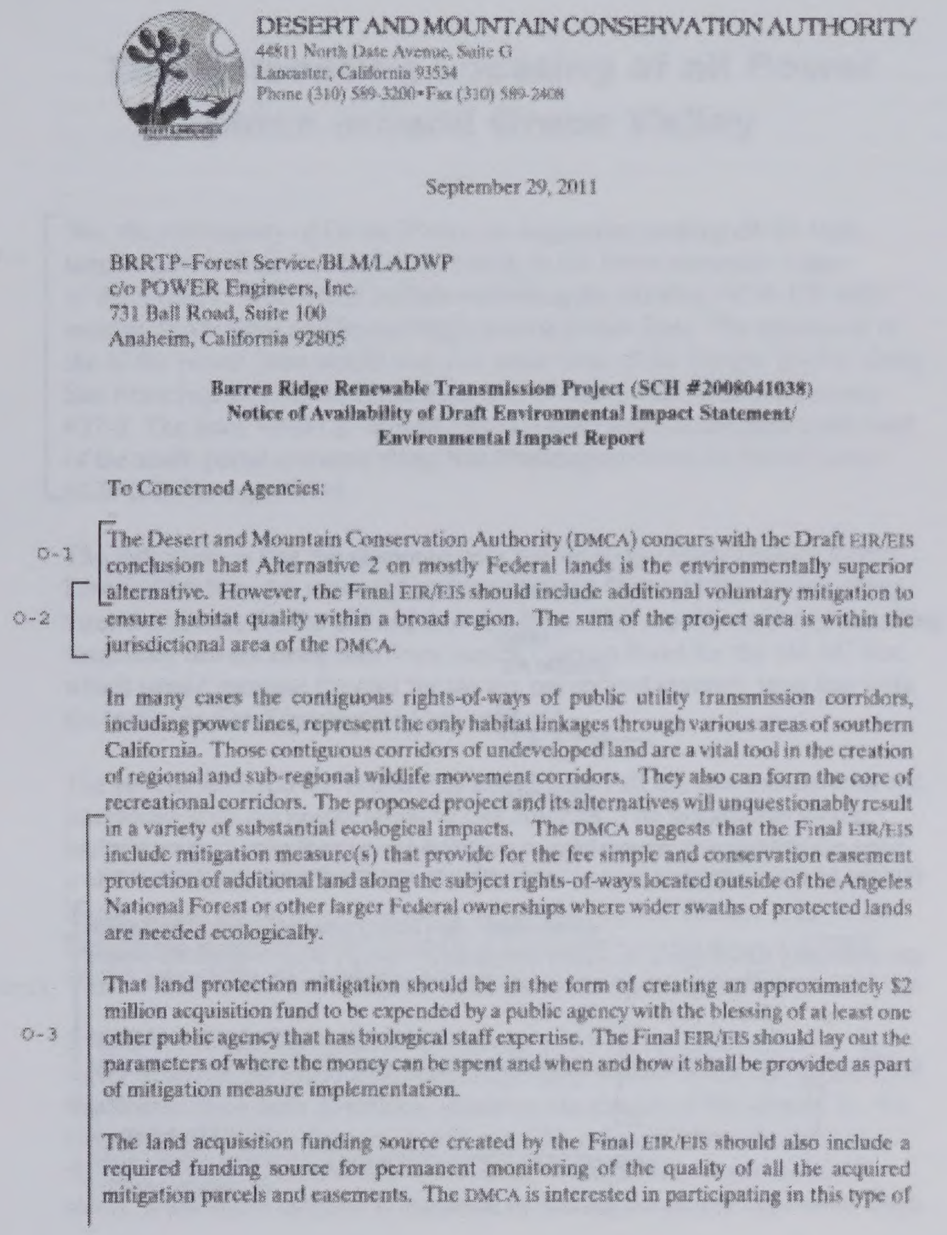
Response N-8: LADWP would not construct above-ground fuel storage tanks on the site of the proposed Haskell Canyon Switching Station, nor was this included in the description of the proposed Project. Fuels may be contained in storage drums or above-ground storage tanks during the construction period, as described on page 4-211 of the Draft EIS/EIR, although mobile fueling units are more commonly used. Implementation of GP-19 would ensure that storage and use of fuels and oils would occur only at approved staging and construction yards.

Response N-9: LADWP will evaluate the need for security cameras during the design stage based on security requirements for new stations.

Response N-10: Two significance criteria relating directly to 100-year floodplains were utilized in analysis of water resources in the Draft EIS/EIR: placing within a 100-year flood hazard area structures that would impede or redirect flood flows, and placing housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map (see page 4-560 of the Final EIS/EIR).

The floodplain risks posed to and by the Haskell Canyon Switching Station and transmission structures are addressed on page 4-532 of the Draft EIS/EIR under the significance criterion regarding placing, within a 100-year flood hazard area, structures that would impede or redirect flood flows. The Haskell Canyon Switching Station is not located within a 100-year floodplain, as delineated by the Federal Emergency Management Agency (FEMA) (see page 75 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR). The nearest 100-year floodplain is that associated with Haskell Canyon, and is located approximately 0.5 mile downstream from the site of the proposed switching station. Furthermore, the switching station would be located on high ground above the intermittent stream to which it would be adjacent, and would not be affected by flood flows associated with the stream.

Portions of the proposed new 230 kV transmission line and reconductoring would be located within 100-year floodplains, specifically within the Antelope Valley, in which a large 100-year floodplain has been delineated by FEMA (see page 24 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR). Because the location of transmission structures is quite flexible, sensitive features, including smaller floodplains, would typically be spanned (i.e., avoided). In the case that transmission structures would be located within a 100-year floodplain, mitigation measures HYD-5 and HYD-6, presented in Table 4.3.3-1 in the Final EIS/EIR, provide mitigation to prevent impedance or redirect flood flows and to minimize the capture of flood debris to prevent flow obstruction and scouring. The Draft and Final EIS/EIR find that with the implementation of mitigation measures HYD-5 and HYD-6, potential impacts resulting from placing structures within the 100-year floodplain and impeding or redirecting flood flows would be reduced to less than significant.



DESERT AND MOUNTAIN CONSERVATION AUTHORITY
44811 North Date Avenue, Suite G
Lancaster, California 93534
Phone (310) 589-3200•Fax (310) 589-2408

September 29, 2011

BRRTP–Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, California 92805

Barren Ridge Renewable Transmission Project (SCH #2008041038)
Notice of Availability of Draft Environmental Impact Statement/
Environmental Impact Report

To Concerned Agencies:

O-1 The Desert and Mountain Conservation Authority (DMCA) concurs with the Draft EIR/EIS conclusion that Alternative 2 on mostly Federal lands is the environmentally superior alternative. O-2 However, the Final EIR/EIS should include additional voluntary mitigation to ensure habitat quality within a broad region. The sum of the project area is within the jurisdictional area of the DMCA.

In many cases the contiguous rights-of-ways of public utility transmission corridors, including power lines, represent the only habitat linkages through various areas of southern California. Those contiguous corridors of undeveloped land are a vital tool in the creation of regional and sub-regional wildlife movement corridors. They also can form the core of recreational corridors. The proposed project and its alternatives will unquestionably result O-3 in a variety of substantial ecological impacts. The DMCA suggests that the Final EIR/EIS include mitigation measure(s) that provide for the fee simple and conservation easement protection of additional land along the subject rights-of-ways located outside of the Angeles National Forest or other larger Federal ownerships where wider swaths of protected lands are needed ecologically.

That land protection mitigation should be in the form of creating an approximately $2 million acquisition fund to be expended by a public agency with the blessing of at least one other public agency that has biological staff expertise. The Final EIR/EIS should lay out the parameters of where the money can be spent and when and how it shall be provided as part of mitigation measure implementation.

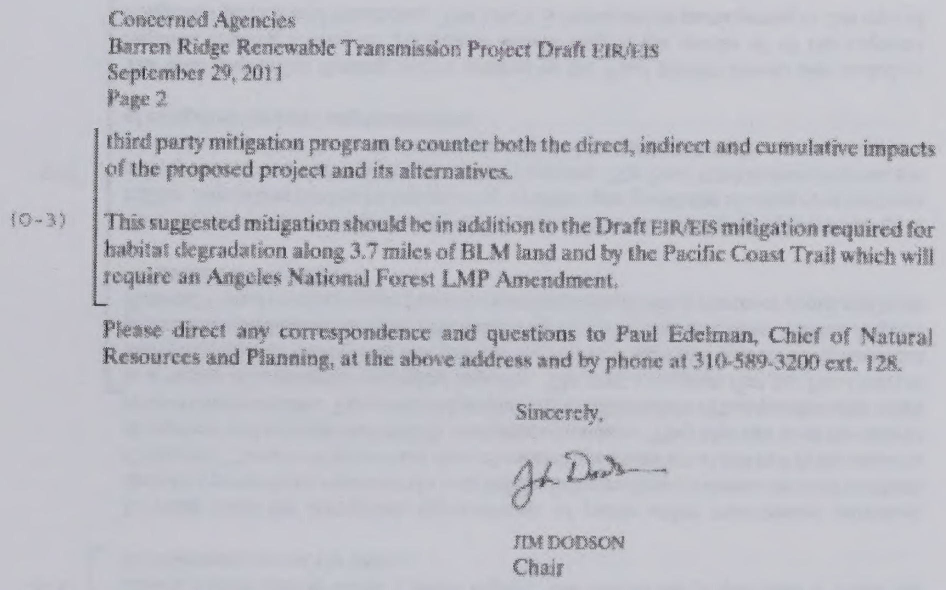
The land acquisition funding source created by the Final EIR/FIS should also include a required funding source for permanent monitoring of the quality of all the acquired mitigation parcels and easements. The DMCA is interested in participating in this type of

LETTER O: DESERT AND MOUNTAIN CONSERVATION AUTHORITY

Response O-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response O-2: If one of the action alternatives is selected, a Habitat Restoration and Revegetation Plan for the Project would be prepared in accordance with mitigation measure BIO-1. For National Forest System lands and public lands managed by the BLM, the agencies would implement a Habitat Restoration and Revegetation Plan for the Project, which would include plans for restoring, enhancing, and/or re-vegetating. LADWP would prepare and implement a similar Habitat Restoration and Revegetation Plan for non-federal lands. Both plans would include creation or restoration of habitat, remediation activities, and a maintenance plan. Mitigation banking would be considered, as appropriate. This restoration effort will ensure habitat quality not only for the immediate Project area, but will support the habitat quality within a broad region.

Response O-3: Your suggested mitigation has been considered; however, we believe the mitigation measures in the Final EIS/EIR are adequate as proposed and satisfy the requirements of mitigation under CEQA and NEPA for addressing the impacts of the Project on biological resources (see Sections 4.3.1 and 5.3.2 of the Final EIS/EIR). Mitigation Measure BIO-1, Provide restoration/ compensation for impacted sensitive vegetation communities, provides for funding for federal agencies to do off-site mitigations or acquire lands (refer to Table 4.3.1-1 in Chapter 4 of the Final EIS/EIR). Additionally, the federal agencies are committed to



Concerned Agencies
Barren Ridge Renewable Transmission Project Draft EIR/EIS
September 29, 2011
Page 2

third party mitigation program to counter both the direct, indirect and cumulative impacts of the proposed project and its alternatives.

(O-3) This suggested mitigation should be in addition to the Draft EIR/EIS mitigation required for habitat degradation along 3.7 miles of BLM land and by the Pacific Coast Trail which will require an Angeles National Forest LMP Amendment.

Please direct any correspondence and questions to Paul Edelman, Chief of Natural Resources and Planning, at the above address and by phone at 310-589-3200 ext. 128.

Sincerely,

JIM DODSON
Chair

working with local conservancies to prioritize opportunities to such off-site mitigation or land acquisition.

The Relocating Locating of all Power Lines around Green Valley

P-1 We, the community of Green Valley are suggesting routing all the high tension power lines around Green Valley in the lower mountain ridges of the forestry. This would include relocating the existing AC & DC high tension power lines and feature high tension power lines. The relocation of the of the power lines would start just north west of the Ranger Station along San Francisquito Canyon Road from the AC tower #223-3 and DC tower #27-2. The lines would go around Green Valley and connect just south west of the south portal entrance along San Francisquito Road to the AC tower #226-2 DC towers #24-4.

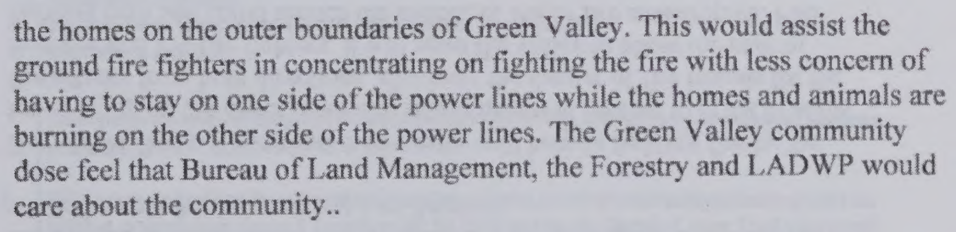
The indication is that the purposed new Barren Ridge High Tension Power Lines will follow the same right of way through Green Valley by installing three tier towers for the old and new AC lines. This would require of installing temporary towers along San Francisquito Canyon Road for the old AC line which would increase the cost for the tax payers and severely inter fear with the traffic on San Francisquito Canyon Road.

The benefit for LADWP is that they could install all the new towers with out interfering with the power going to Los Angeles. The installation would include a new tower for the old AC line, new tower for the old DC line and a new two tier tower for the new AC lines. This would reduce the risk of losing all the power to Los Angeles by having two AC towers. If LADWP have to put in the three tier towers and the tower lines go down LADWP would lose all the AC power to Los Angeles.

Benefit for Green Valley and the Forestry will help in fighting fire by the tower being on the lower mountain ridges they will be able to bring in aerial fire attacks from both directions, eliminate the danger of fire islands for the Forestry and LA fire fighters, it will open the valley to allow the ease of fighting fires and could reduce the chance of major fire catastrophic. Fire safety is the major concern in our area, by having the power lines away from

LETTER P: GREEN VALLEY TOWN COUNCIL

Response P-1: As a result of public comments on the Draft EIS/EIR, a new alternative in the Green Valley area, the Green Valley Multi-Line Relocation Alternative, was examined, which would locate the proposed double-circuit 230 kV and relocate the existing single-circuit 230 kV and 500 kV DC lines into a new corridor primarily in the ANF and just outside of the community. See pages 2-31 through 2-36 of the Final EIS/EIR for a full description of this alternative. As described there, the proposed route of the Green Valley Multi-Line Relocation Alternative was determined to be a feasible location for a relocation of all transmission lines in the Green Valley area. The Green Valley Multi-Line Relocation Alternative was considered but eliminated from detailed analysis in the Final EIS/EIR because it did not have the potential to avoid or minimize environmental impacts as compared to the Proposed Action. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



the homes on the outer boundaries of Green Valley. This would assist the ground fire fighters in concentrating on fighting the fire with less concern of having to stay on one side of the power lines while the homes and animals are burning on the other side of the power lines. The Green Valley community dose feel that Bureau of Land Management, the Forestry and LADWP would care about the community..

The power lines are already going through the forest which should stay in the forest. By rerouting the old AC & DC Power Lines and the new AC Power Lines the relocating would start west of the Ranger Station while the rerouting should go through the lower ridges of the forest to the south of South Portal. Then by reconnecting to the old power route lines which run the rest of the way through the forest. We are only asking to keep the power lines in the forest which.

**The dark red lines is the purposed relocation of
the old & new LADWP power lines around
Green Valley**

POWER Engineers, Inc. Page 1 of 1

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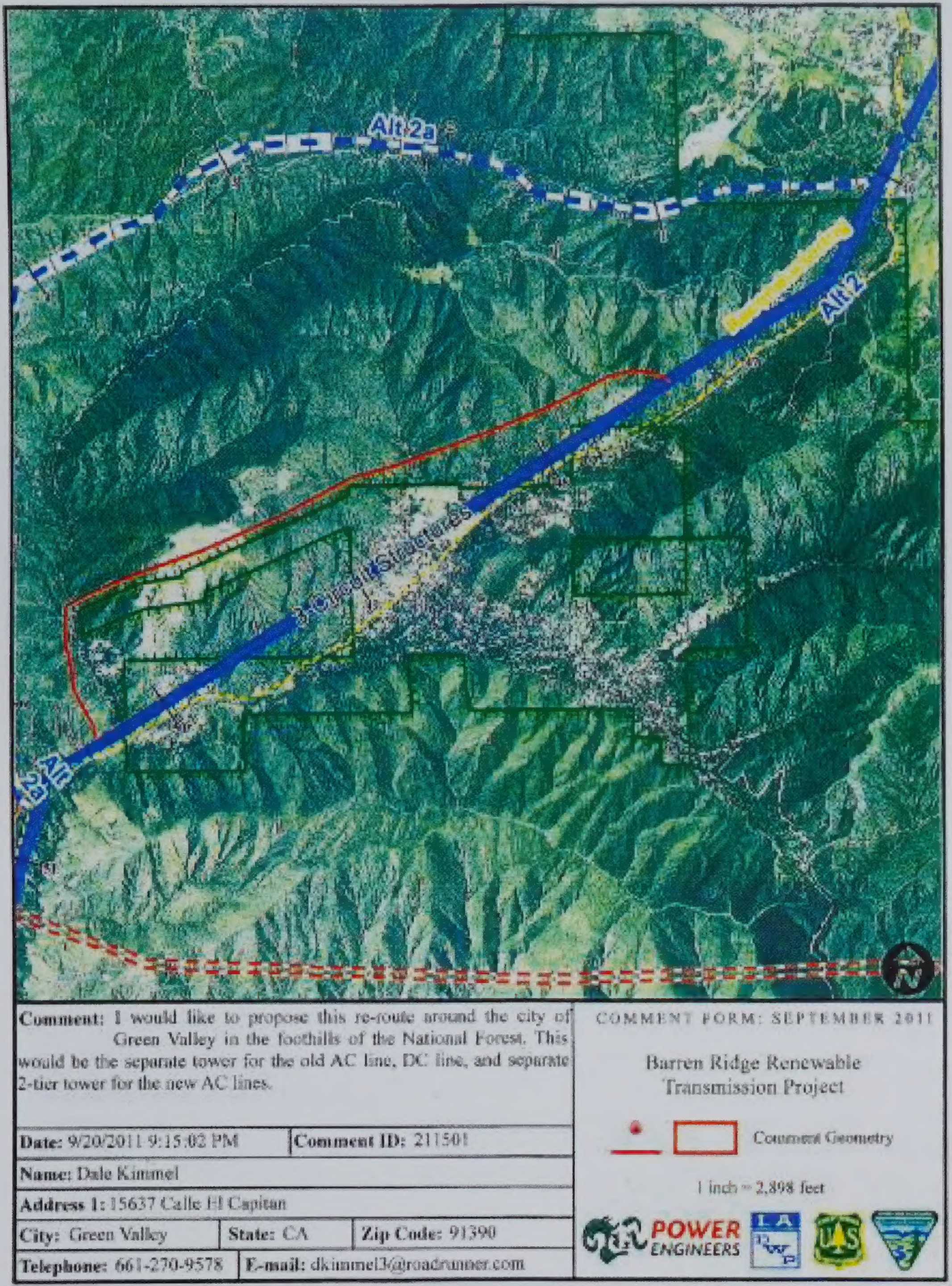


Comment: I would like to propose this re-route around the city of Green Valley in the foothills of the National Forest. This would be the separate tower for the old AC line, DC line, and separate 2-tier tower for the new AC lines.

Date: 9/20/2011 9:15:02 PM
Comment ID: 211501
Name: Dale Kimmel
Address 1: 15637 Calle El Capitan
City: Green Valley
State: CA
Zip Code: 91390
Telephone: 661-270-9578
E-mail: dkimmel3@roadrunner.com

COMMENT FORM: SEPTEMBER 2011

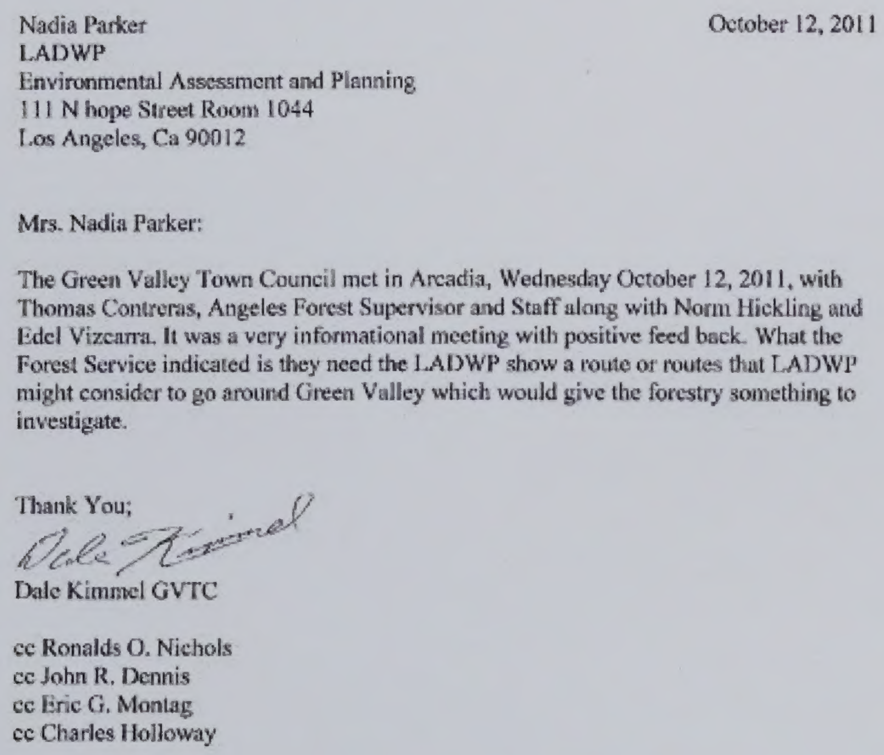
Barren Ridge Renewable
Transmission Project

● 🟥 Comment Geometry

1 inch = 2,898 feet

POWER ENGINEERS

LETTER Q: GREEN VALLEY TOWN COUNCIL



Nadia Parker
LADWP
Environmental Assessment and Planning
111 N hope Street Room 1044
Los Angeles, Ca 90012

October 12, 2011

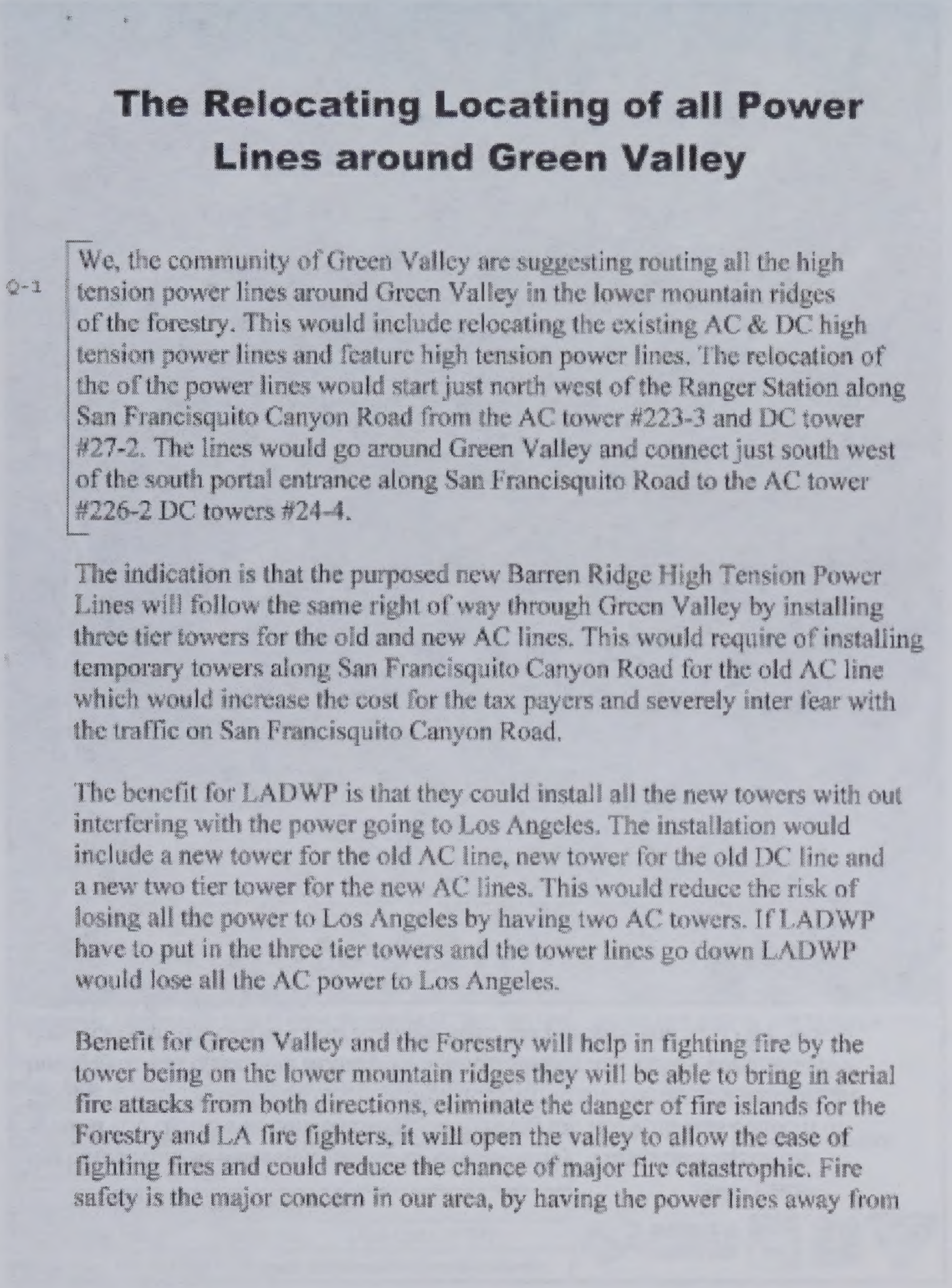
Mrs. Nadia Parker:

The Green Valley Town Council met in Arcadia, Wednesday October 12, 2011, with Thomas Contreras, Angeles Forest Supervisor and Staff along with Norm Hickling and Edel Vizcarra. It was a very informational meeting with positive feed back. What the Forest Service indicated is they need the LADWP show a route or routes that LADWP might consider to go around Green Valley which would give the forestry something to investigate.

Thank You;
Dale Kimmel
Dale Kimmel GVTC

cc Ronalds O. Nichols
cc John R. Dennis
cc Eric G. Montag
cc Charles Holloway

Response Q-1: Please refer to Response P-1. See pages 2-31 through 2-36 in Chapter 2 of the Final EIS/EIR for a full description of the Green Valley Multi-Line Relocation Alternative. As described there, LADWP provided a feasibility analysis of four potential routes to USFS in the process of developing the proposed Alternative. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



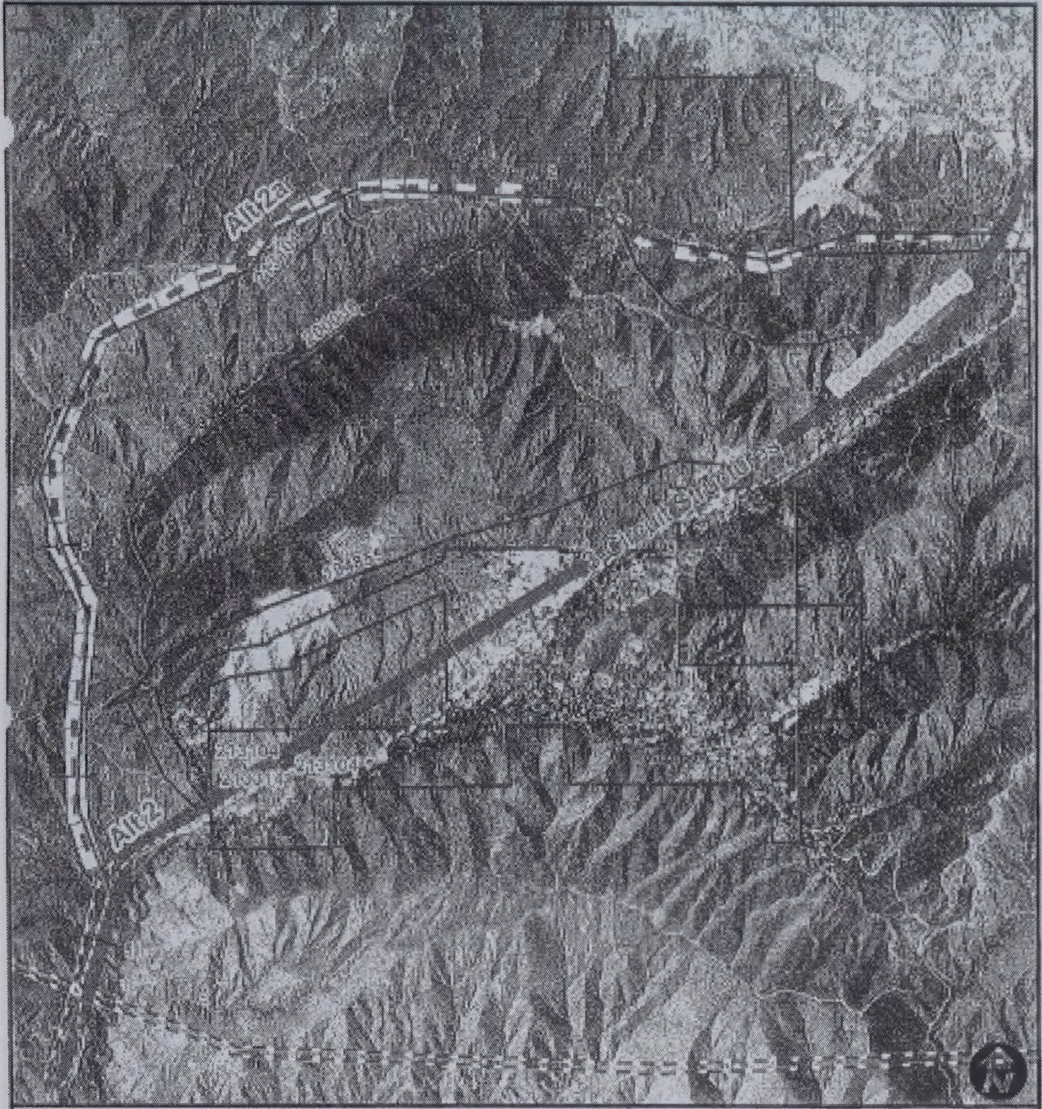
The Relocating Locating of all Power Lines around Green Valley

Q-1 We, the community of Green Valley are suggesting routing all the high tension power lines around Green Valley in the lower mountain ridges of the forestry. This would include relocating the existing AC & DC high tension power lines and feature high tension power lines. The relocation of the of the power lines would start just north west of the Ranger Station along San Francisquito Canyon Road from the AC tower #223-3 and DC tower #27-2. The lines would go around Green Valley and connect just south west of the south portal entrance along San Francisquito Road to the AC tower #226-2 DC towers #24-4.

The indication is that the purposed new Barren Ridge High Tension Power Lines will follow the same right of way through Green Valley by installing three tier towers for the old and new AC lines. This would require of installing temporary towers along San Francisquito Canyon Road for the old AC line which would increase the cost for the tax payers and severely inter fear with the traffic on San Francisquito Canyon Road.

The benefit for LADWP is that they could install all the new towers with out interfering with the power going to Los Angeles. The installation would include a new tower for the old AC line, new tower for the old DC line and a new two tier tower for the new AC lines. This would reduce the risk of losing all the power to Los Angeles by having two AC towers. If LADWP have to put in the three tier towers and the tower lines go down LADWP would lose all the AC power to Los Angeles.

Benefit for Green Valley and the Forestry will help in fighting fire by the tower being on the lower mountain ridges they will be able to bring in aerial fire attacks from both directions, eliminate the danger of fire islands for the Forestry and LA fire fighters, it will open the valley to allow the ease of fighting fires and could reduce the chance of major fire catastrophic. Fire safety is the major concern in our area, by having the power lines away from the homes on the outer boundaries of Green Valley. This would assist the ground fire fighters in concentrating on fighting the fire with less concern of having to stay on one side of the power lines while the homes and animals are burning on the other side of the power lines. The Green Valley community dose feel that Bureau of Land Management, the Forestry and LADWP would care about the community..



Comment: I propose this route to move the existing DC lines and new AC lines because of the existing access already maintained by the Forest Service. This road is very well maintained. Putting the route here would get rid of the fire pocket that is currently being proposed. I'm concerned about the safety of myself and my neighbors

Date: 9/29/2011 8:00:37 PM	**Comment ID:** 200036	
Name: Richard Brownfield		
Address 1: 38621 San Francisco Canyon Rd		
City: Green Valley	**State:** CA	**Zip Code:** 91390
Telephone: 661-270-9534	**E-mail:** featherandfur@roadrunner.com	

COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ☐ Comment Geometry

1 inch = 3,060 feet

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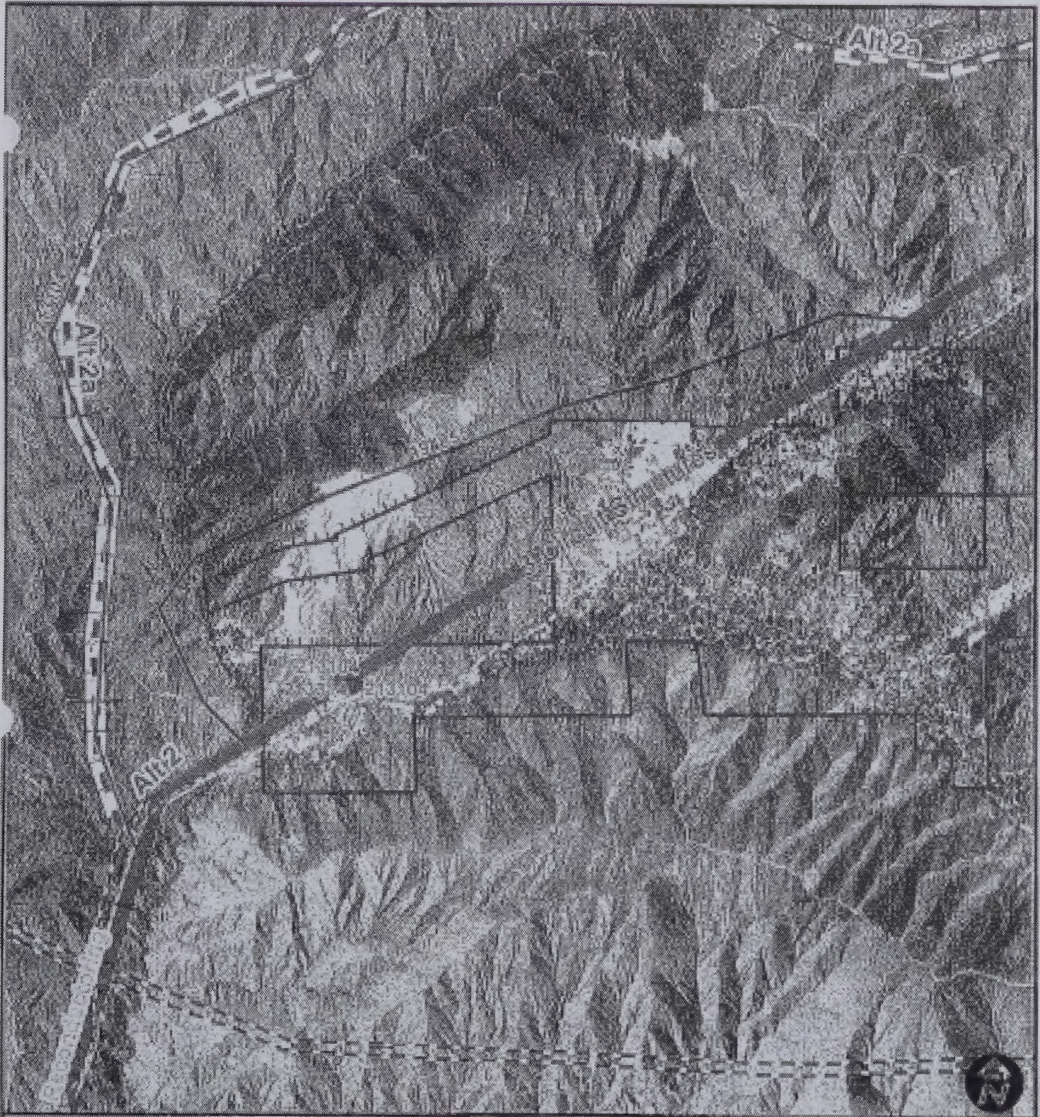


Comment: I want the old AC & DC line + the double tower for the new AC lines to go around Green Valley, It'll start SW of the ranger station from AC tower 223-3 & DC tower 27-2 and go all around Green Valley in the National Forest ending at the South portal at AC tower 226-2 and DC tower 24-4.

Date: 9/29/2011 7:48:56 PM	**Comment ID:** 194855

Name: Dale Kimmel

Address 1: 15637 Calle El Capitan

City: Green Valley	**State:** CA	**Zip Code:** 91390

Telephone: 661-270-9578	**E-mail:** dkimmel3@roadrunner.com

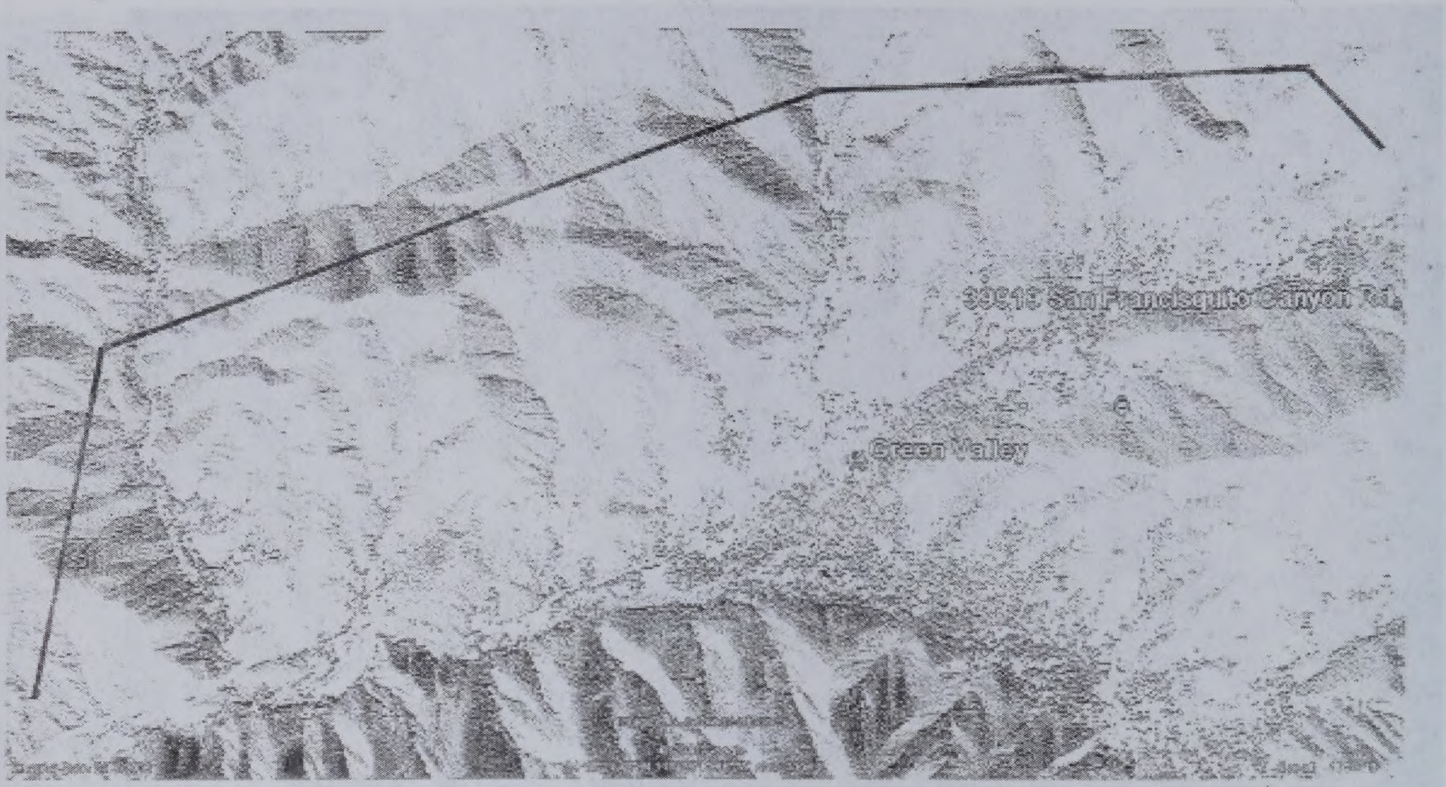
COMMENT FORM: SEPTEMBER 2011

Barren Ridge Renewable
Transmission Project

● ▭ Comment Geometry

1 inch = 2,486 feet

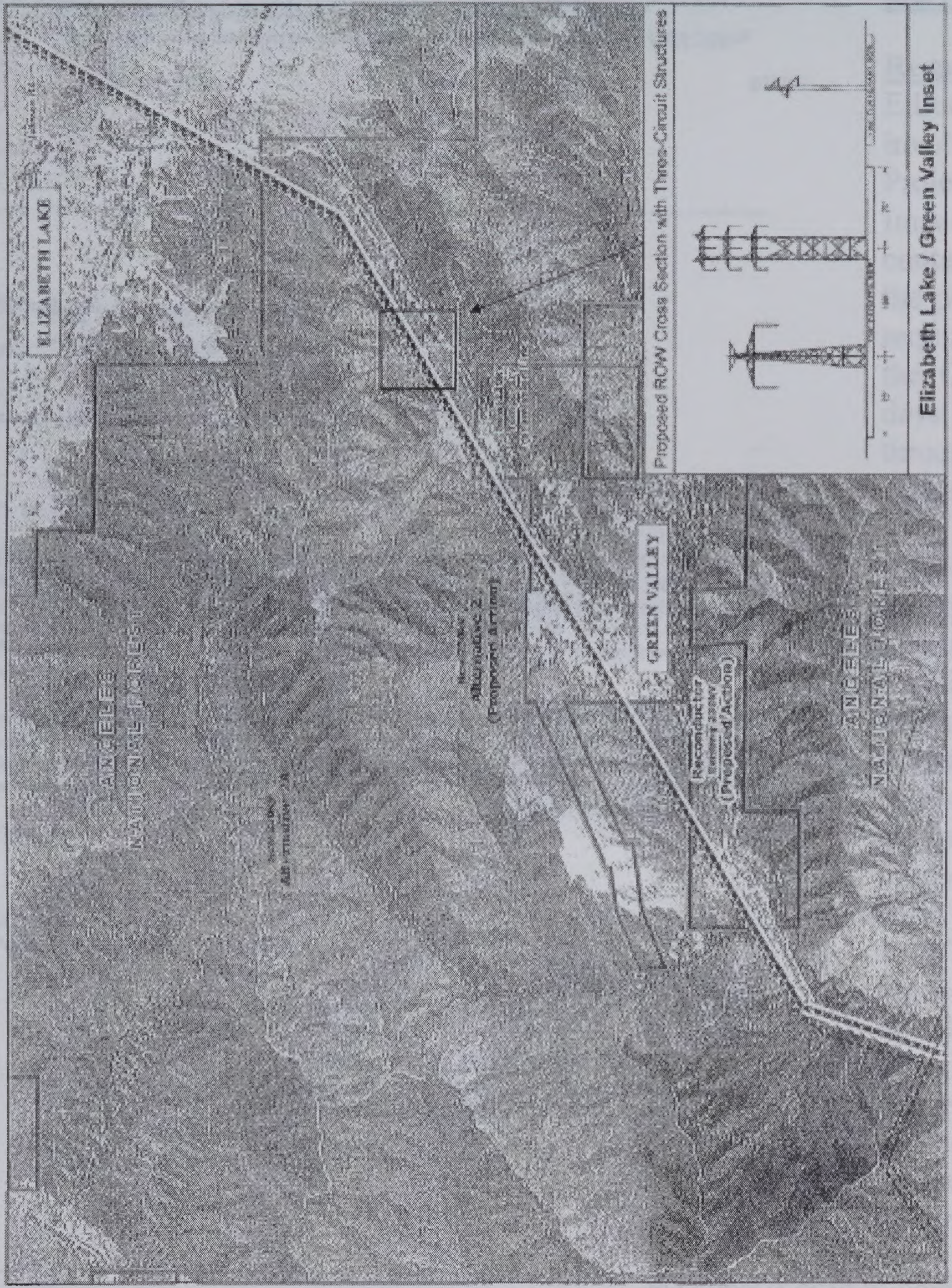
POWER ENGINEERS

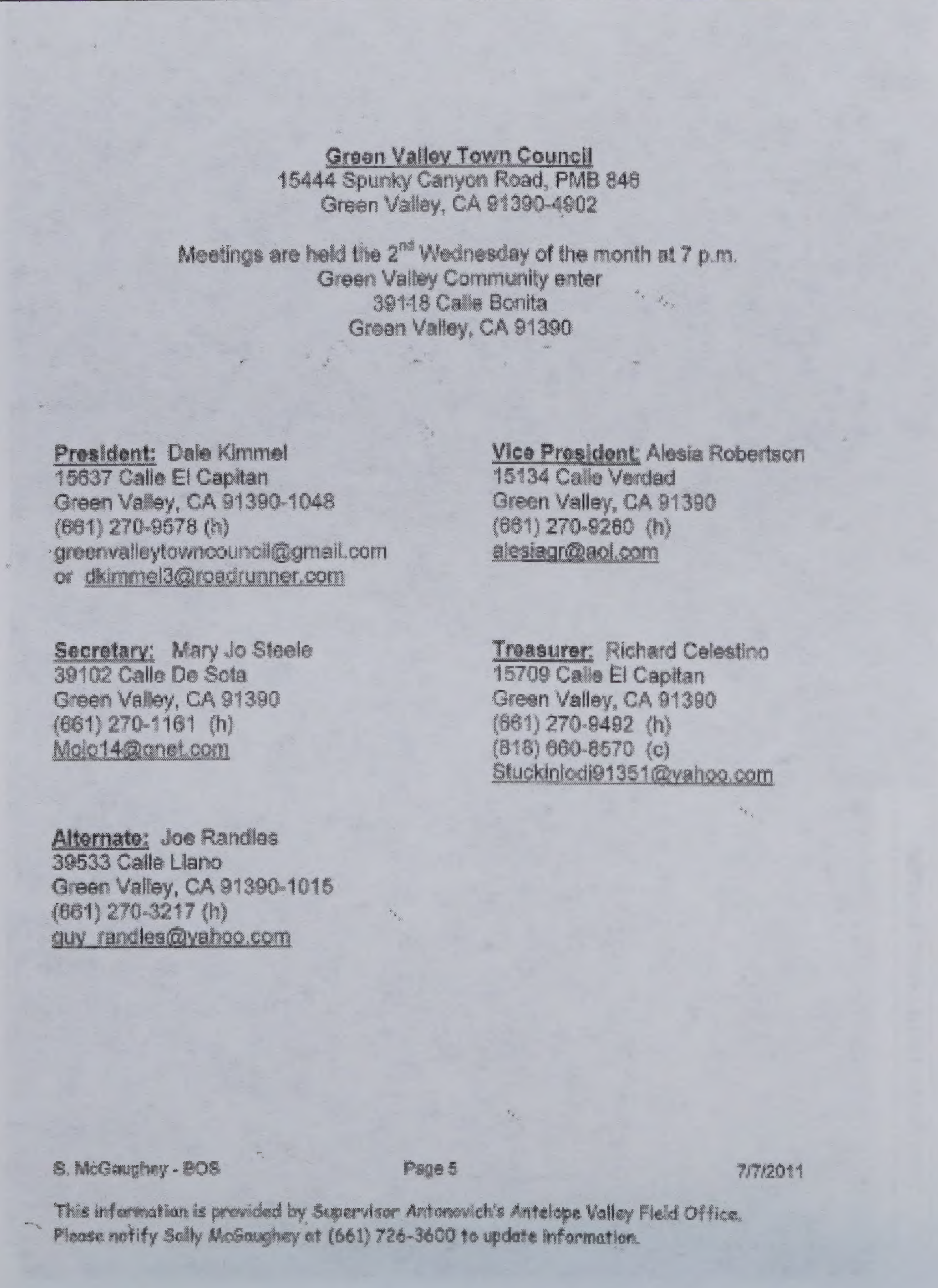


The 2nd suggestion for relocating all of the Old & New Power Lines around Green Valley, which would be starting south west of the Ranger Station while still staying in the lower ridges of the forest but going out a little further and ending up at the third set of Electrical Power Line Towers just south of the South Portal. This will do away with fire islands.

POWER Engineers, Inc. Page 1 of 1

http://www.powereng-ppm.com/BRRT/dashboardclient/ 9/26/2011


ELIZABETH LAKE
ANGELES NATIONAL FOREST
New 230kV
Alternative 2A
New 230kV
Alternative 2
(Proposed Action)
GREEN VALLEY
Reconductor
Existing 230kV
(Proposed Action)
ANGELES NATIONAL FOREST
Proposed ROW Cross Section with Three-Circuit Structures
Elizabeth Lake / Green Valley Inset



Green Valley Town Council
15444 Spunky Canyon Road, PMB 846
Green Valley, CA 91390-4902

Meetings are held the 2nd Wednesday of the month at 7 p.m.
Green Valley Community enter
39118 Calle Bonita
Green Valley, CA 91390

President: Dale Kimmel
15637 Calle El Capitan
Green Valley, CA 91390-1048
(661) 270-9578 (h)
greenvalleytowncouncil@gmail.com
or dkimmel3@roadrunner.com

Vice President: Alesia Robertson
15134 Calle Verdad
Green Valley, CA 91390
(661) 270-9260 (h)
alesiagr@aol.com

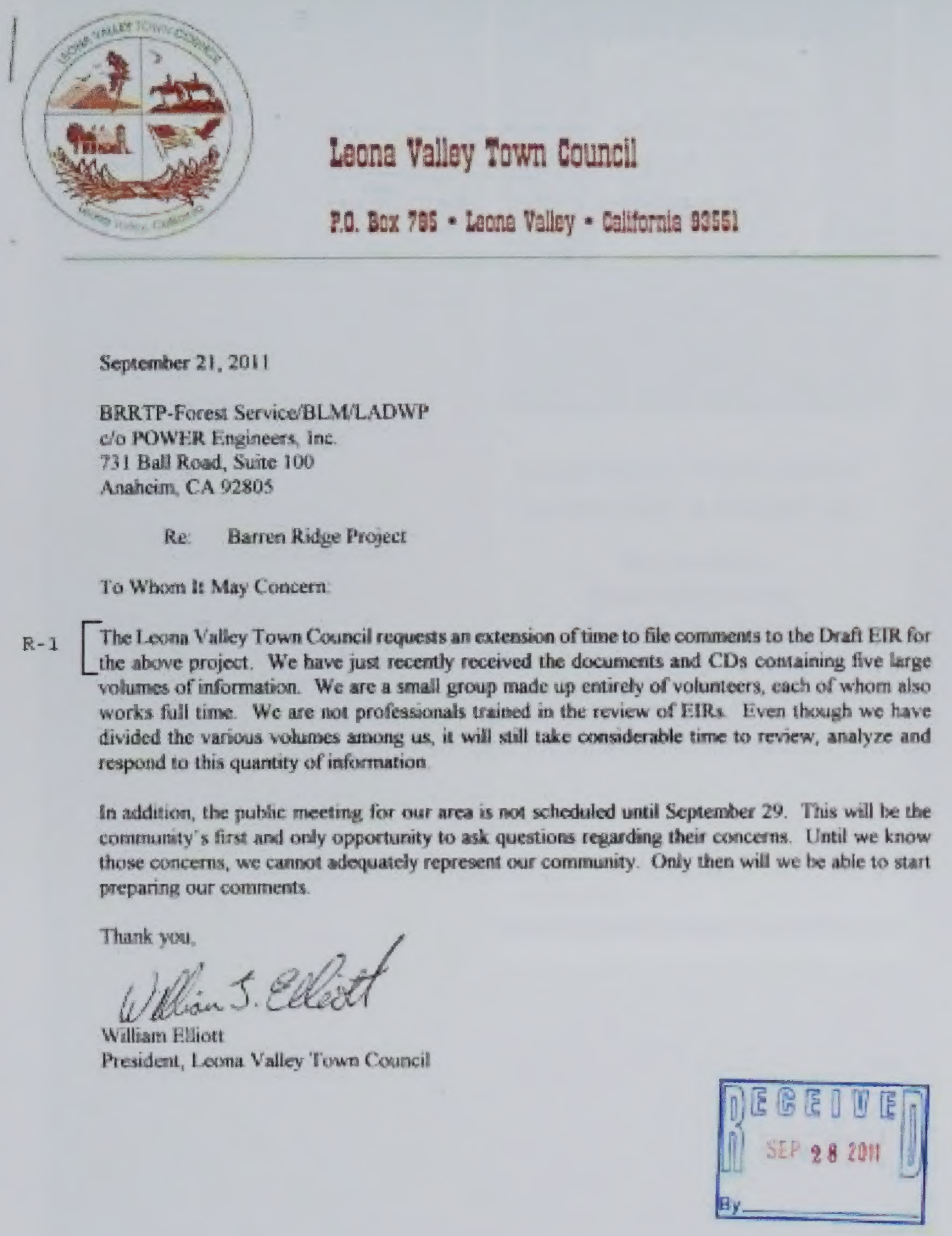
Secretary: Mary Jo Steele
39102 Calle De Sota
Green Valley, CA 91390
(661) 270-1161 (h)
Mojo14@qnet.com

Treasurer: Richard Celestino
15709 Calle El Capitan
Green Valley, CA 91390
(661) 270-9492 (h)
(818) 660-8570 (c)
Stuckinlodi91351@yahoo.com

Alternate: Joe Randles
39533 Calle Llano
Green Valley, CA 91390-1015
(661) 270-3217 (h)
guy_randles@yahoo.com

S. McGaughey - BOS Page 5 7/7/2011

This information is provided by Supervisor Antonovich's Antelope Valley Field Office.
Please notify Sally McGaughey at (661) 726-3600 to update information.



Leona Valley Town Council
P.O. Box 795 • Leona Valley • California 93551

September 21, 2011

BRRTP-Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Re: Barren Ridge Project

To Whom It May Concern:

R-1 The Leona Valley Town Council requests an extension of time to file comments to the Draft EIR for the above project. We have just recently received the documents and CDs containing five large volumes of information. We are a small group made up entirely of volunteers, each of whom also works full time. We are not professionals trained in the review of EIRs. Even though we have divided the various volumes among us, it will still take considerable time to review, analyze and respond to this quantity of information.

In addition, the public meeting for our area is not scheduled until September 29. This will be the community's first and only opportunity to ask questions regarding their concerns. Until we know those concerns, we cannot adequately represent our community. Only then will we be able to start preparing our comments.

Thank you,

William S. Elliott

William Elliott
President, Leona Valley Town Council

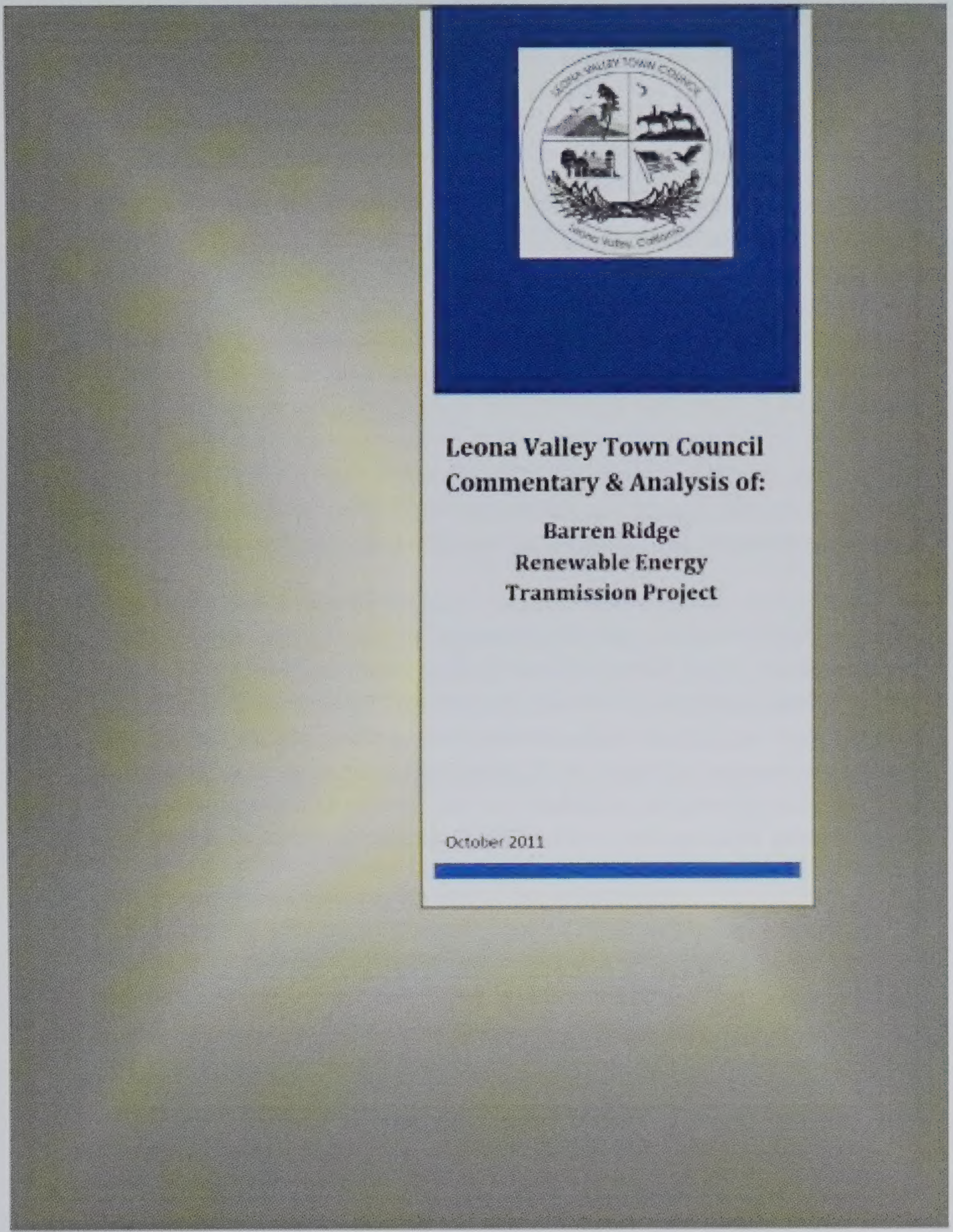
RECEIVED
SEP 28 2011
By

LETTER R: LEONA VALLEY TOWN COUNCIL

Response R-1: (The following reply was mailed directly to Mr. Elliot at the Leona Valley Town Council). We appreciate your involvement regarding the Barren Ridge Renewable Transmission Project Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). Due to the large volume of information contained in the Draft EIS/EIR, we initially extended established the public review period beyond the 45 day public review period required by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) to allow 60 days for public review and comment. Public notice was provided through advertisements in local newspapers the week before the comment period opened.

Additionally, five public meeting were held during the month of September in the project area, including one in the community of Leona Valley on September 29. These meetings provided an additional opportunity for the public to receive basic project information, ask questions of the project team, and to submit comments regarding the project and Draft EIS/EIR. Additional opportunities to ask questions and receive information regarding the proposed project and environmental review process include calling the BRRTP hotline at (877) 440-3592 (TTY/TDD users can call (800) 735-2922), submitting an email to the project team at BRRTP@powereng.com, and visiting the project website at www.ladwp.com/barrenridge. I [Charles Holloway] can be reached at 213-367-0285 or at Charles.holloway@ladwp.com for any questions regarding the proposed project or environmental review process. Representatives of the federal agencies can also be contacted with any questions regarding their involvement in the project. At the Angeles National Forest, Justin Seastrand, Environmental Coordinator, can be reached at 626-574-5278 or jseastrand@fs.fed.us, and at the BLM, Lynnette Elser, NEPA Coordinator, can be reached at (951) 697-5233 or lelser@blm.gov.

Because the scheduled public review period is already longer than that required by NEPA and CEQA, we do not plan to extend the review period further. The public review period runs from August 26 to October 25, 2011. Please let us know if you have any additional questions or need any additional information.



Leona Valley Town Council
Commentary & Analysis of:

Barren Ridge
Renewable Energy
Tranmission Project

October 2011

LETTER S: LEONA VALLEY TOWN COUNCIL

EXECUTIVE SUMMARY

The Leona Valley Town Council represents the concerns of the citizens of Leona Valley. While we are generally supportive of the need for renewable energy (RE) development, our contention is that utility organizations and utility-scale RE providers, in their rush to meet the State-mandated Renewable Portfolio Standard (RPS) and grab the related potential business opportunities, are causing serious negative impacts on our rural community and environment.

The designated process for weighing and acting on the competing interests of the various stakeholders concerned with the movement of power from utility scale concentrations of RE to major load centers is the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). As is required by CEQA as well as NEPA, the LADWP has prepared an Environmental Impact Report for the proposed Barren Ridge Renewable Energy Project. Based upon our initial findings, there are serious deficiencies that will require considerable further analysis and review by the LADWP.

We seek corrections and further scrutiny of the errors and omissions. The Leona Valley Town Council is providing clear notice to LADWP, that the CEQA and NEPA process is not just a paperwork exercise to get past. Whatever Alternative is ultimately chosen, true mitigation efforts and fair compensation for the private pain that is endured to meet the common good must be effectuated. Undergrounding portions of the power lines, which was requested at numerous scoping meetings, would lessen the adverse impact on our communities. More generally, we believe that an emphasis on distributed generation (e.g., rooftop solar installations) and energy efficiency would negate a significant portion of the need for new transmission capacity and thus the visual blight, fire-fighting interference, adverse species impacts and private-property acquisitions that have so aroused our communities.

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SAVE MONO LAKE

In 1941, the Los Angeles Department of Water & Power began diverting water from Mono Lake's tributary streams 350-miles south to meet the growing water demands of the City. Deprived of its freshwater sources, the volume of Mono Lake halved, while its salinity doubled. Unable to adapt to these changing conditions within such a short period of time, the ecosystem began to collapse. Islands, previously important nesting sites, became peninsulas vulnerable to mammalian and reptilian predation. Photosynthetic rates of algae, the base of the food chain, were reduced while reproductive abilities of brine shrimp became impaired. Stream ecosystems unraveled due to lack of water. Air quality grew poor as the exposed lake bed became the source of air-borne particulate matter, violating the Clean Air Act. If something was not done, Mono Lake was certain to become a lifeless chemical sump.[1] In 1978 the Save Mono Lake Committee was formed. Since 1978, numerous accomplishments have been achieved to save the lake, through negotiation, legislation and litigation. In a 1994 landmark decision made by the State Water Resources Control Board, the Los Angeles Department of Water and Power had its licenses amended, forcing compliance with Fish and Game code requirements for Mono Lake's tributary, steams and on top of the water need to protect the fisheries, thereby amending the agreement of water diversion with the LA DWP. As of 1998, the State ordered a restoration of Mono Lake. Today, the LADWP conducts annual monitoring of the restoration process.

In 2007, Mayor Antonio Villaraigosa implemented a plan to secure the water supply of Los Angeles. In doing so, the City will become less reliant on outside resources, such as Mono Lake, by the use of conservation measures such as recycling water, capturing storm-water, acceleration of groundwater basin clean-up and expanding groundwater storage. Because of its historical effort to obtain water from alternate resources, the City of Los Angeles ultimately lead the way to severely degrading the environment in the Owen's Valley. Today, the City has committed to making environmental enhancements which are considered among the most far-reaching environmental restoration projects in United States history. [2]

This history of the City of Los Angeles and how it is tied to the incredible environmental degradation of the Owen's Valley as well as numerous other areas throughout the State of California is a lesson learned by many. Unfortunately, this lesson appears to be ignored by the City of Los Angeles and its Department of Water & Power. For in its desire to obtain electricity

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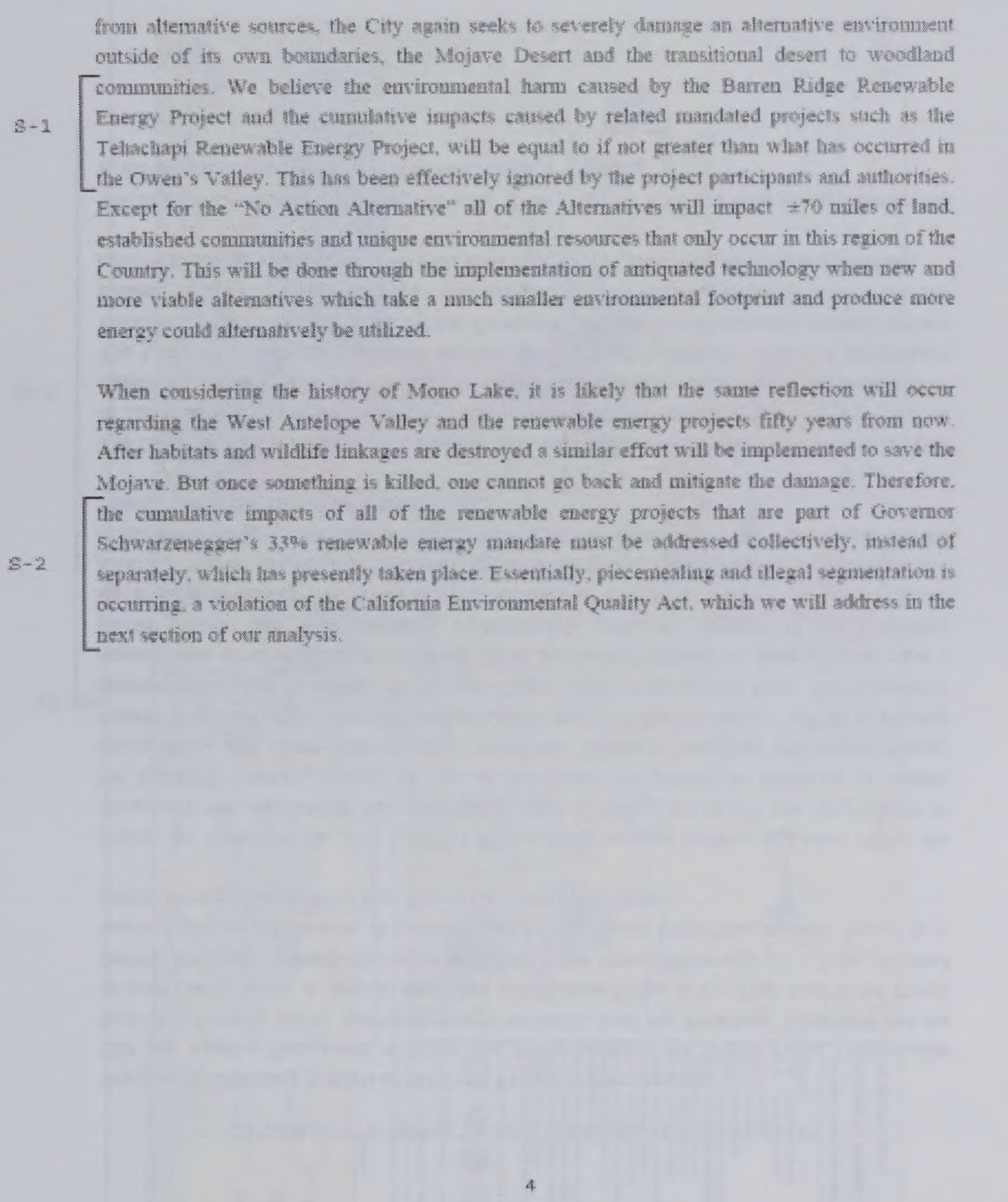
[1] http://www.monolake.org/about/story

[2] http://mayor.lacity.org/stellent/groups/ElectedOfficials/@MYR_CH_Contributor/documents/Contributor_Web_Content/LACITY_004714.pdf



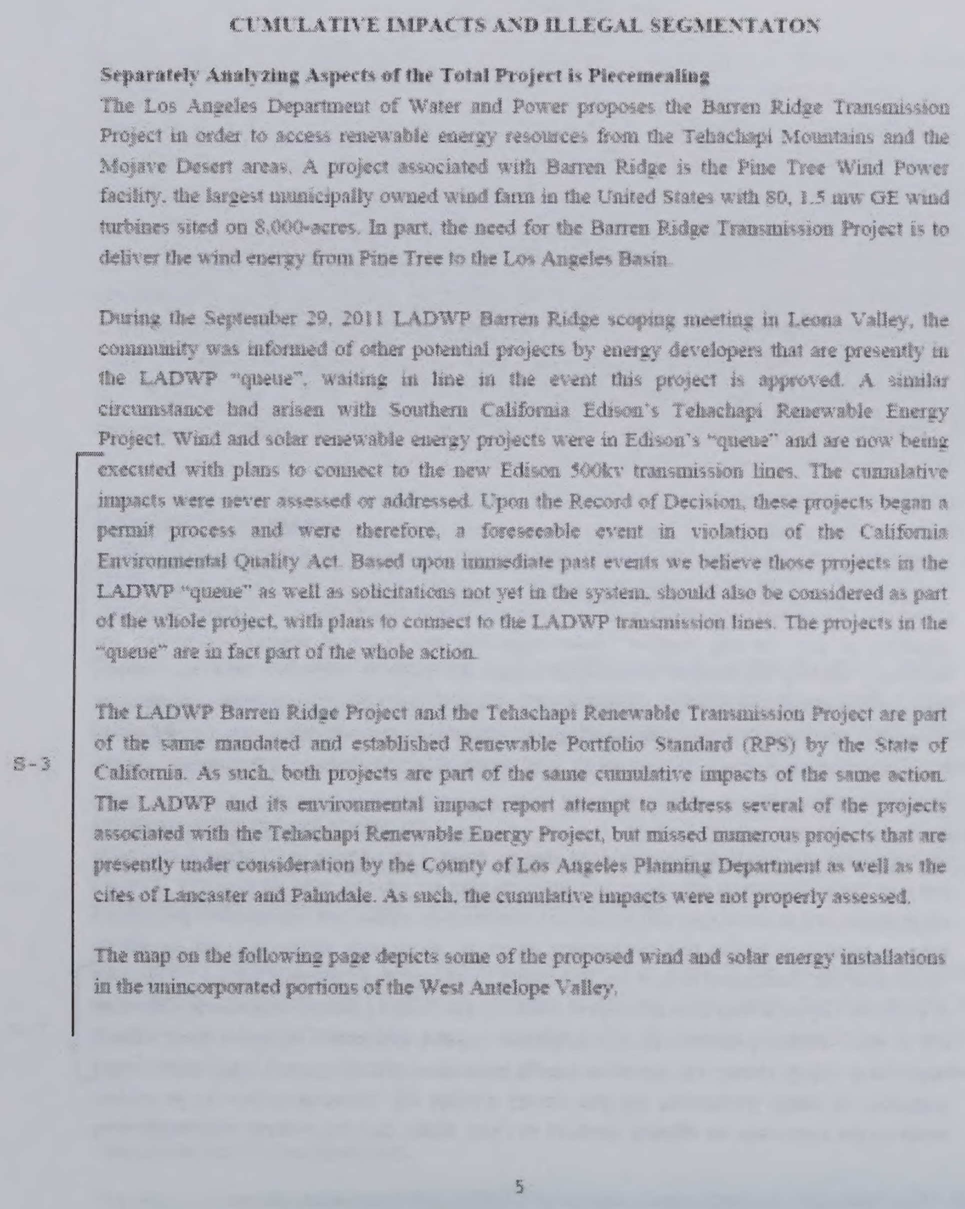
from alternative sources, the City again seeks to severely damage an alternative environment outside of its own boundaries, the Mojave Desert and the transitional desert to woodland S-1 communities. We believe the environmental harm caused by the Barren Ridge Renewable Energy Project and the cumulative impacts caused by related mandated projects such as the Tehachapi Renewable Energy Project, will be equal to if not greater than what has occurred in the Owen's Valley. This has been effectively ignored by the project participants and authorities. Except for the "No Action Alternative" all of the Alternatives will impact ±70 miles of land, established communities and unique environmental resources that only occur in this region of the Country. This will be done through the implementation of antiquated technology when new and more viable alternatives which take a much smaller environmental footprint and produce more energy could alternatively be utilized.

When considering the history of Mono Lake, it is likely that the same reflection will occur regarding the West Antelope Valley and the renewable energy projects fifty years from now. After habitats and wildlife linkages are destroyed a similar effort will be implemented to save the Mojave. But once something is killed, one cannot go back and mitigate the damage. Therefore, S-2 the cumulative impacts of all of the renewable energy projects that are part of Governor Schwarzenegger's 33% renewable energy mandate must be addressed collectively, instead of separately, which has presently taken place. Essentially, piecemealing and illegal segmentation is occurring, a violation of the California Environmental Quality Act, which we will address in the next section of our analysis.

Response S-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. The Draft EIS/EIR did fully evaluate the environmental impacts of the Proposed Action and Alternatives, and the cumulative effects of projects such as the Tehachapi Renewable Transmission Project. Additionally, the cumulative project list has been updated in the Final EIS/EIR to reflect current status of present and reasonably foreseeable future projects in the Project area (refer to Section 5.2 in Chapter 5 of the Final EIS/EIR).

Response S-2: Assembly Bill 32, the Global Warming Solutions Act, which established statewide greenhouse gas emission limits, is not the Proposed Action, nor a part of the Proposed Action, described in the Draft EIS/EIR. Additionally, LADWP is not subject to the State-mandated Renewable Portfolio Standard, but rather, the City of Los Angeles has its own renewable standards. As such, the Project has not been illegally segmented.

Chapter 5 (pages 5-1 through 5-105) of the Final EIS/EIR is the evaluation of cumulative effects. Additionally, the cumulative project list has been updated in the Final EIS/EIR to reflect current status of present and reasonably foreseeable future projects in the Project area (refer to Section 5.2 in Chapter 5 of the Final EIS/EIR).



CUMULATIVE IMPACTS AND ILLEGAL SEGMENTATON

Separately Analyzing Aspects of the Total Project is Piecemealing
The Los Angeles Department of Water and Power proposes the Barren Ridge Transmission Project in order to access renewable energy resources from the Tehachapi Mountains and the Mojave Desert areas. A project associated with Barren Ridge is the Pine Tree Wind Power facility, the largest municipally owned wind farm in the United States with 80, 1.5 mw GE wind turbines sited on 8,000-acres. In part, the need for the Barren Ridge Transmission Project is to deliver the wind energy from Pine Tree to the Los Angeles Basin.

During the September 29, 2011 LADWP Barren Ridge scoping meeting in Leona Valley, the community was informed of other potential projects by energy developers that are presently in the LADWP "queue", waiting in line in the event this project is approved. A similar circumstance had arisen with Southern California Edison's Tehachapi Renewable Energy Project. Wind and solar renewable energy projects were in Edison's "queue" and are now being executed with plans to connect to the new Edison 500kv transmission lines. The cumulative impacts were never assessed or addressed. Upon the Record of Decision, these projects began a permit process and were therefore, a foreseeable event in violation of the California Environmental Quality Act. Based upon immediate past events we believe those projects in the LADWP "queue" as well as solicitations not yet in the system, should also be considered as part of the whole project, with plans to connect to the LADWP transmission lines. The projects in the "queue" are in fact part of the whole action.

S-3

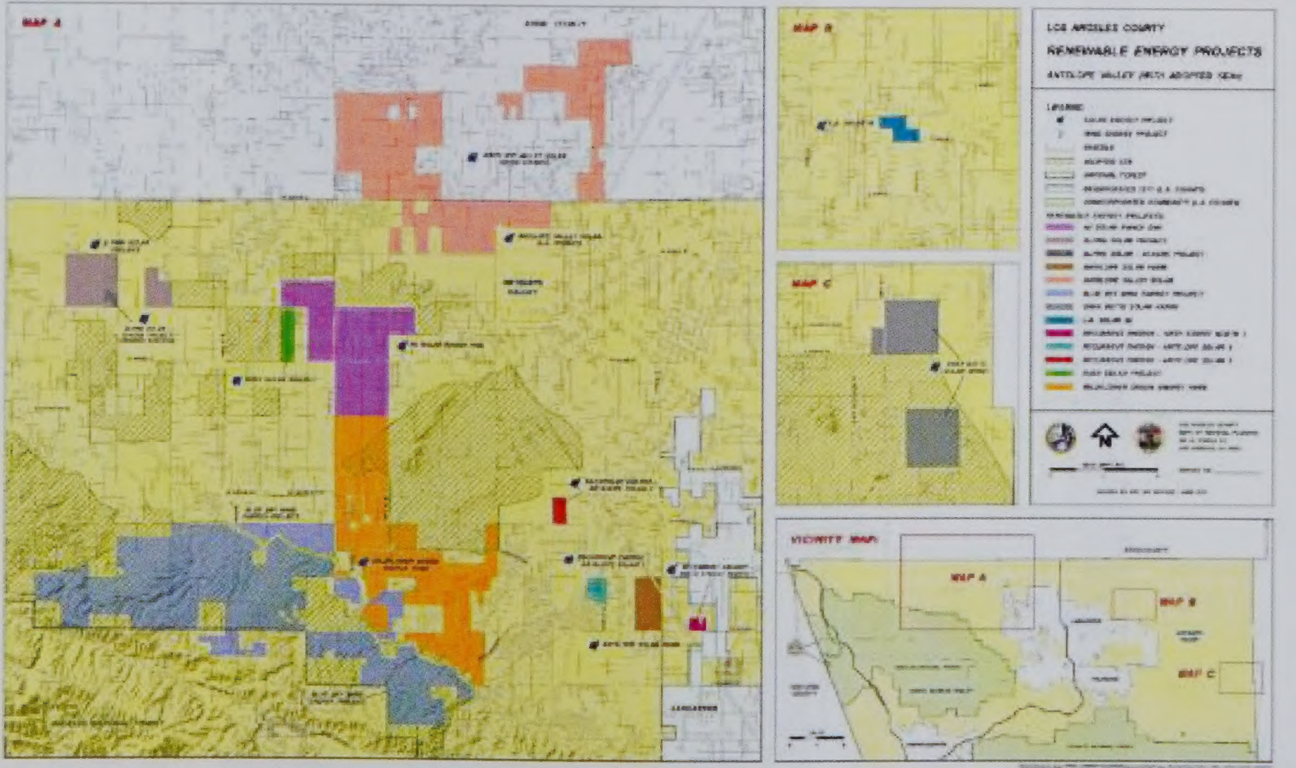
The LADWP Barren Ridge Project and the Tehachapi Renewable Transmission Project are part of the same mandated and established Renewable Portfolio Standard (RPS) by the State of California. As such, both projects are part of the same cumulative impacts of the same action. The LADWP and its environmental impact report attempt to address several of the projects associated with the Tehachapi Renewable Energy Project, but missed numerous projects that are presently under consideration by the County of Los Angeles Planning Department as well as the cites of Lancaster and Palmdale. As such, the cumulative impacts were not properly assessed.

The map on the following page depicts some of the proposed wind and solar energy installations in the unincorporated portions of the West Antelope Valley.

5

Response S-3: We began compiling the list of present and reasonably foreseeable actions for the cumulative effects analysis with the scoping process for this Project and completed the list during the final preparations for release of the Draft EIS/EIR (in August 2011). However, several renewable projects found on the Los Angeles County Department of Regional Planning's Renewable Energy Projects List have been added to the Final EIS/EIR in Table 5-1. These include projects that have recently started the environmental review process. The table has also been updated to include all known projects in the impact area currently under review with Kern County, Los Angeles County, and federal agencies prior to release of the Final EIS/EIR.

The LADWP interconnection queue represents projects for which a request has been made to interconnect to LADWP's existing or planned facilities. It is known in the electric utility industry that many of these projects in the queue are speculative, never proceed to environmental review, and are never constructed and operated. It is not possible to know which projects in the interconnection queue will be built and which ones won't. Instead, the cumulative effects analysis used a list of projects that have initiated environmental review, e.g., the NEPA or the CEQA environmental review process. This project list better represents the reasonably foreseeable actions and, as stated in the Draft EIS/EIR, was current as of April 2011. See Mandelker, NEPA Law and Litigation (2011) at 10:42.3 ("Most courts have … held that *Kleppe* [*v. Sierra Club,* 427 U.S. 390 (1976)] does not require discussion of the cumulative impacts of actions that are only planned or contemplated."). LADWP is not subject to the State-mandated Renewable Portfolio Standard that may involve projects such as the Tehachapi Renewable Transmission Project. Instead, the City of Los Angeles has its own renewable standards. The BRRTP is solely the responsibility of the LADWP for the City of Los Angeles.


MAP A
MAP B
MAP C
LOS ANGELES COUNTY
RENEWABLE ENERGY PROJECTS
ANTELOPE VALLEY (WITH ADOPTED SEAs)
LEGEND
VICINITY MAP
MAP A
MAP B
MAP C

(S-3)

(S-3)

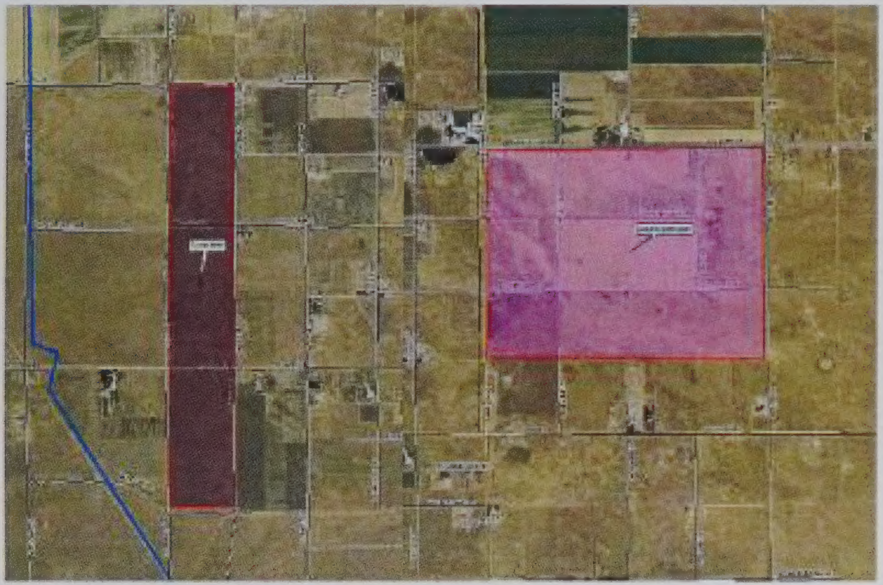
Project Name/Applicant	*Project Number*	*Technology*	*Power (MW)*	*Size (Acres)*	*Status*	*Planner*	*Notes*
AV Solar Ranch One/ First Solar	R2009-02239	Photovoltaic Solar	230	2300	Approved	Kim Szalay	
Alpine Solar Project/ NRG	**R2009-02089**	**Photovoltaic Solar**	**92**	**800 (580 used for energy production)**	**Approved**	**Adam Thurtell**	
Alpine Solar 35-Acre Project/ NRG	**R2009-02089**	**Photovoltaic Solar**	**N/A**	**35**	**Early environmental review**	**Adam Thurtell**	**Thirty-five-acre addition to Alpine Solar Project**
Antelope Solar Farm/FRV	**R2011-00377**	**Photovoltaic Solar**	**20**	**320 (200 used for energy production)**	**Early environmental review**	**Anthony Curzi**	
Ruby Solar Project/Ruby Solar LLC	**R2011-00410**	**Photovoltaic Solar**	**20**	**140**	**Early environmental review**	**Anthony Curzi**	
L.A. Solar 20/L.A. Solar 20, LLC	**R2010-01638**	**Photovoltaic Solar**	**20**	**155**	**Early environmental review**	**Anthony Curzi**	
Recurrent-Antelope Solar 1/ Recurrent Energy	**R2010-00911**	**Photovoltaic Solar**	**10**	**111**	**Early environmental review**	**Anthony Curzi**	
Recurrent-Antelope Solar 2/ Recurrent Energy	**R2008-00878**	**Photovoltaic Solar**	**10**	**80**	**Early environmental review**	**Anthony Curzi**	
Recurrent-105th Street North/ Recurrent Energy	**R2010-01041**	**Photovoltaic Solar**	**6**	**40**	**Early environmental review**	**Anthony Curzi**	
Blue Sky/Nextera	**R2011-[illegible]**	**Wind Turbine**	**225**	**6500**	**Early environmental review**	**Adam Thurtell**	
Wildflower Green Energy Farm/Element Power	**R2010-00256**	**Wind Turbine**	**300**	**5787**	**Early environmental review**	**Anthony Curzi**	
Gray Butte Solar Array/AES Solar	**R2009-01148**	**Photovoltaic Solar**	**150**	**1100**	**DEIR under preparation**	**Anthony Curzi**	
Antelope Valley Solar/Renewable Resources Group	R2010-00808	Photovoltaic Solar	650 (156 in La County)	1238 in La County, 3937 in Kern County	DEIR released; awaiting hearing at RPC	Adam Thurtell	Joint Kern/LA Project; Kern County Lead Agency
Total		**1,733 (1,239 in LA County)**	**16,632**				

The above table includes all of the unincorporated Los Angeles County Renewable Energy Projects as of June 2011.

Those projects depicted in red, were not included in the "Proposed Generation Projects in the Project Vicinity" in the Cumulative Impacts section of the Environmental Impact Report.

(S-3) Other renewable energy projects missing from the LADWP environmental impact report which were not considered in the cumulative impacts include, but are not limited to the following:

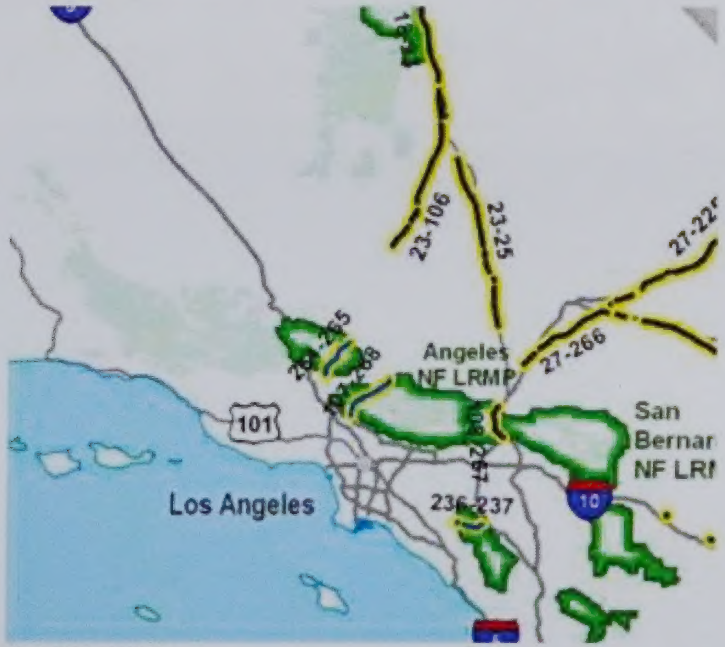
- Tuusso Solar: 216 acres with 20 megawatts of generation
- Beautiful Earth: 187 acres; 38 megawatts of generation
- Palmdale Hybrid Power Plant



Map depicting Beautiful Earth Solar and Tuusso Solar

8

S-4 The environmental impact report also fails account for the amount of private land acquisition in the West Antelope Valley that will be taken via eminent domain through the Department of Energy and its Federal Corridor project. While the Federal map is vague, it is now known that Segment 264-265 will eventually connect to Segment 23-106, bisecting through the West Antelope Valley; the "gaps" are private property and the eminent domain action will require miles of 3,500-feet in width takings.



Federal Corridor Map

Response S-4: The Project would not involve any land that would be taken via eminent domain by the Department of Energy. The Department of Energy is not involved in the BRRTP. It is not possible to know at this juncture how much land would be acquired by LADWP through eminent domain in the implementation of the proposed Project. Eminent domain would only be used as a last resort to acquire necessary land rights, and land acquisition instead will be done through a process of negotiations with the landowners. The process of negotiating for the required land across private property is described on page 2-59 of the Final EIS/EIR.

S-5

On September 29, 2011, the Leona Valley Town Council requested from the LADWP information on all of the projects within their "queue" and we were advised that this information would be forthcoming. On September 30, 2011 the Leona Valley Town Council's Land Use Committee requested this information in writing and again on October 8, 2011. The following LADWP "queue" was received from Charles Holloway of the LADWP on October 11, 2011:

Last Updated 10/7/2011

Queue Number	Request Date	Max Summer MW Output	Max Winter MW Output	Location	Interconnection Facility	COD	Facility Type	Status
060131000000	01/31/06	150	150	Mohave, CA	Pine Tree 230kV Substation	Nov-12	Wind	SIS Completed
070302000000	03/02/07	200	200	Beaver City, Utah	(I) IPP 345kV Switchyard	Jan-11	Wind	SIS in progress
070302000001	03/02/07	200	200	Beaver City, Utah	(I) IPP 345kV Switchyard	Mar-11	Wind	
070302000002	03/02/07	200	200	Beaver City, Utah	(I) IPP 345kV Switchyard	Jul-11	Wind	
070409000000	04/09/07	300.8	300.8	Harper Lake, CA	(M) Marketplace-Adelanto 500kV Line	Jan-12	Solar	SIS completed
070612000000	06/12/07	200	200	Primm, NV	Mead-Victorville 287kV Line	Jul-13	Solar	Feasibility Study Agreement being prepared
[illegible]	[illegible]	250	250	Kern County, CA	Barren Ridge 230 kV Substation	May-13	Solar	Feasibility Study in progress
071102000000	11/02/07	250	250	Armistead, CA	Owens Gorge - Rinaldi 230kV Line	Dec-11	Solar	Feasibility Study Agreement transmitted
071214000000	12/14/07	201	201	Rose Valley, CA	Owens Gorge - Rinaldi 230kV Line	Dec-14	Wind	Feasibility Study Agrmnt transmitted
080108000000	01/08/08	130	130	Barstow, CA	Mead-Victorville 287kV Line	Aug-10	Wind	SIS Agreement transmitted
080211000000	02/11/08	150	150	Mojave, CA	Pine Tree 230kV Substation	Apr-13	Wind	No Progress
080214000000	02/14/08	300	300	Kern County, CA	Barren Ridge - Castaic 230kV Line	Dec-11	Wind	Feasibility Study completed
080220000000	02/20/08	110	110	Primm, NV	Mead-Victorville 287kV Line	Oct-11	Solar	Feasibility Study Agreement being prepared
080220000001	02/20/08	110	110	Primm, NV	Mead-Victorville 287kV Line	Oct-12	Solar	Feasibility Study Agreement being prepared
080317000001	03/17/08	250	250	Baker, CA	(M) Marketplace-Adelanto 500kV Line	Mar-13	Solar	SIS Completed
080519000001	05/19/08	640	640	Jean, NV	McCullough-Victorville 500kV Line	May-13	Solar	Feasibility Study Agreement being prepared
080904000000	08/29/08	204	204	Mojave, CA	Owens Gorge - Rinaldi 230kV Line	Oct-11	Wind	SIS Agreement transmitted
080918000000	09/18/08	350	350	Baker, CA	McCullough-Victorville 500kV Line 1	May-13	Solar	Scoping Meeting held
080930000000	09/30/08	300	300	California City, CA	Barren Ridge 230 kV Substation	Sep-12	Solar	Feasibility Study in completed
081010000000	10/10/08	100	100	Daggett, CA	McCullough-Victorville 500kV Line 2	May-13	Solar	Scoping Meeting held
090123000000	01/23/09	250	250	Palmdale, CA	Barren Ridge - Castaic 230kV Line	Dec-11	Solar	Request being processed
090325000000	03/25/09	150	150	Boulder City, NV	(J) McCullough 230kV Substation	Aug-11	Solar	Feasibility Study Completed
091103000000	11/03/09	200	200	Owens Valley, CA	Owens Gorge - Rinaldi 230kV Line	Dec-12	Solar	Scoping Meeting held
100122000000	01/22/10	90	90	California City, CA	Barren Ridge 230 kV Substation	Dec-11	Solar	Feasibility Study in progress
100301000000	03/01/10	139	139	Kern County, CA	Barren Ridge 230 kV Substation	Dec-13	Solar	Feasibility Study in progress
100504000000	05/04/10	49.9	49.9	Mohave, CA	Barren Ridge Rinaldi 230 kV	Aug-13	Solar	Feasibility Study in progress
100615000001	06/15/10	150	150	Kern County, CA	Owens Gorge - Rinaldi 230kV Line	Feb-13	Wind	Scoping Meeting scheduled
100615000002	06/15/10	150	150	Kern County, CA	Owens Gorge - Rinaldi 230kV Line	Feb-13	Solar	Scoping Meeting scheduled
100819000001	08/19/10	200.1	200.1	Lancaster, CA	Owens Gorge - Rinaldi 230kV Line	Dec-12	Wind	Feasibility Study in progress
101018000000	10/18/10	199.5	199.5	Hamblin Valley, UT	Gonder - Intermountain 230kV Line	Nov-12	Wind	Feasibility Study in progress
101215000000	12/15/10	300	300	Kern County, CA	Barren Ridge - Rinaldi 230kV Line	Dec-14	Solar	Feasibility Study in progress
110322000000	03/22/11	350	350	Clark County, NV	(J) Crystal 500kV Substation	Nov-12	Solar	Feasibility Study in progress
110907000000	09/07/11	100	100	Kern County, CA	Barren Ridge Switching Station	Jun-11	Solar	Request being processed
110919000000	09/19/11	250	250	Kern County, CA	Barren Ridge Switching Station	Jun-11	Solar	Request being processed
111003000000	10/03/11	200	200	Independence, CA	Owens Gorge - Rinaldi 230kV Line	Nov-14	Solar	Request being processed
					(I) Intermountain Power Project Facility			
					(J) Other Jointly-Owned Facility			
					(M) Mead-Adelanto Project Facility			

Because the majority of the proposed generation projects in the immediate proximity of the Barren Ridge Renewable Energy Project proposal *were not* included in the study, the environmental impact report is deficient and the cumulative adverse impacts were not properly addressed.

In ascertaining the cumulative environmental impacts for the West Antelope Valley Area, one should also address those features that are unique to this region. For example, the energy projects associated with the Tehachapi Renewable Energy transmission project, the Barren Ridge Renewable Transmission line proposal and the shadow inventory of projects that are in the LADWP's "queue" will nearly fully cover the internationally recognized Audubon Antelope

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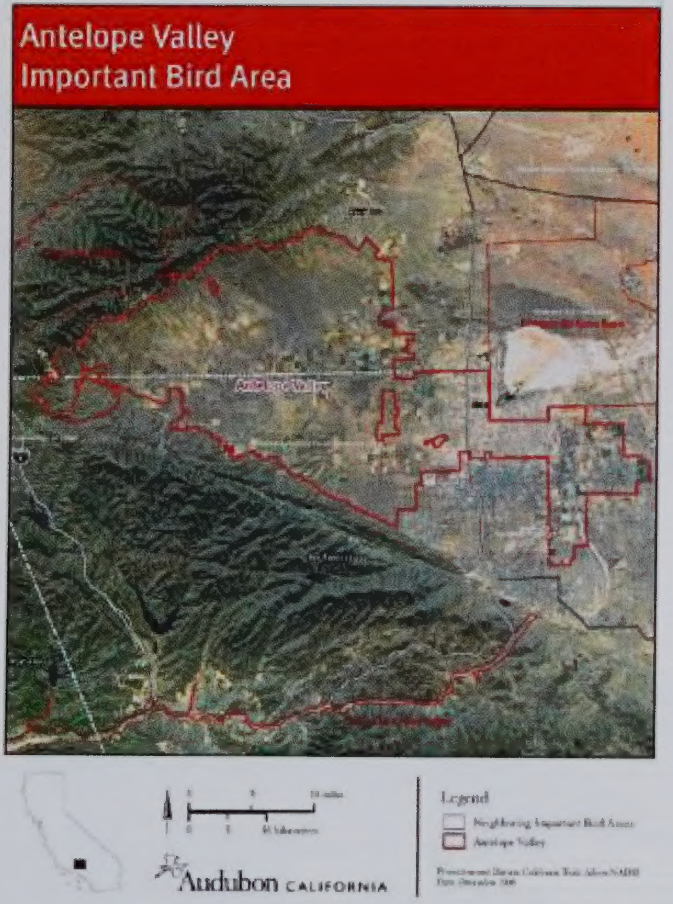
Response S-5: The LADWP interconnection queue represents projects for which a request has been made to interconnect to LADWP's existing or planned facilities. It is normal that many projects in the queue never proceed to environmental review and are never constructed and operated. It's not possible to know which projects in the queue will be built and which ones won't.

Refer to Chapter 5 of the Final EIS/EIR for the analysis of cumulative effects and to Response S-3 above. This analysis is not deficient because it thoroughly considered the past, present, and reasonably foreseeable future actions within the Project impact area as defined in Section 5.1.1, Methodology, in the Final EIS/EIR and in Response S-3 above). The interconnection process alone, as you suggest, was not considered to reliably represent the list of projects that would actually be constructed and operated, and was not considered a reasonable approach. Instead, as described in Response S-3 above, we used the list of projects that have initiated the NEPA or CEQA environmental review process. Additionally, the cumulative project list has been updated in the Final EIS/EIR to reflect the current status of present and reasonably foreseeable future projects in the Project area (refer to Section 5.2 in Chapter 5 of the Final EIS/EIR).

While cumulative effects to sensitive bird species and habitat are described in Chapter 5, Section 5.3.2, Biological Resources, of the Final EIS/EIR, the Audubon Antelope Valley Important Bird Area was not specifically addressed in the Draft EIS/EIR. A discussion of the Audubon Antelope Valley Important Bird Area has been added to the cumulative effect analysis on page 5-100 of the Final EIS/EIR.

(S-5) Valley Important Bird Area, thereby putting a critical habitat and internationally recognized special status at risk.


Antelope Valley
Important Bird Area
Antelope Valley
Legend
Neighboring Important Bird Areas
Antelope Valley
Audubon CALIFORNIA

Leona Valley, which is part of the San Andreas Significant Ecological Area, is presently completing a study to establish its own Audubon Important Bird Area which will include the land north of the Angeles National Forest, south of Portal Ridge and the desert floor, extending from Three Points/Liebre Mountain through Elizabeth Lake, Lake Hughes, Leona Valley, Ritter Ranch and terminating at Palmdale Lake. Based upon our initial analysis, there is a sufficient

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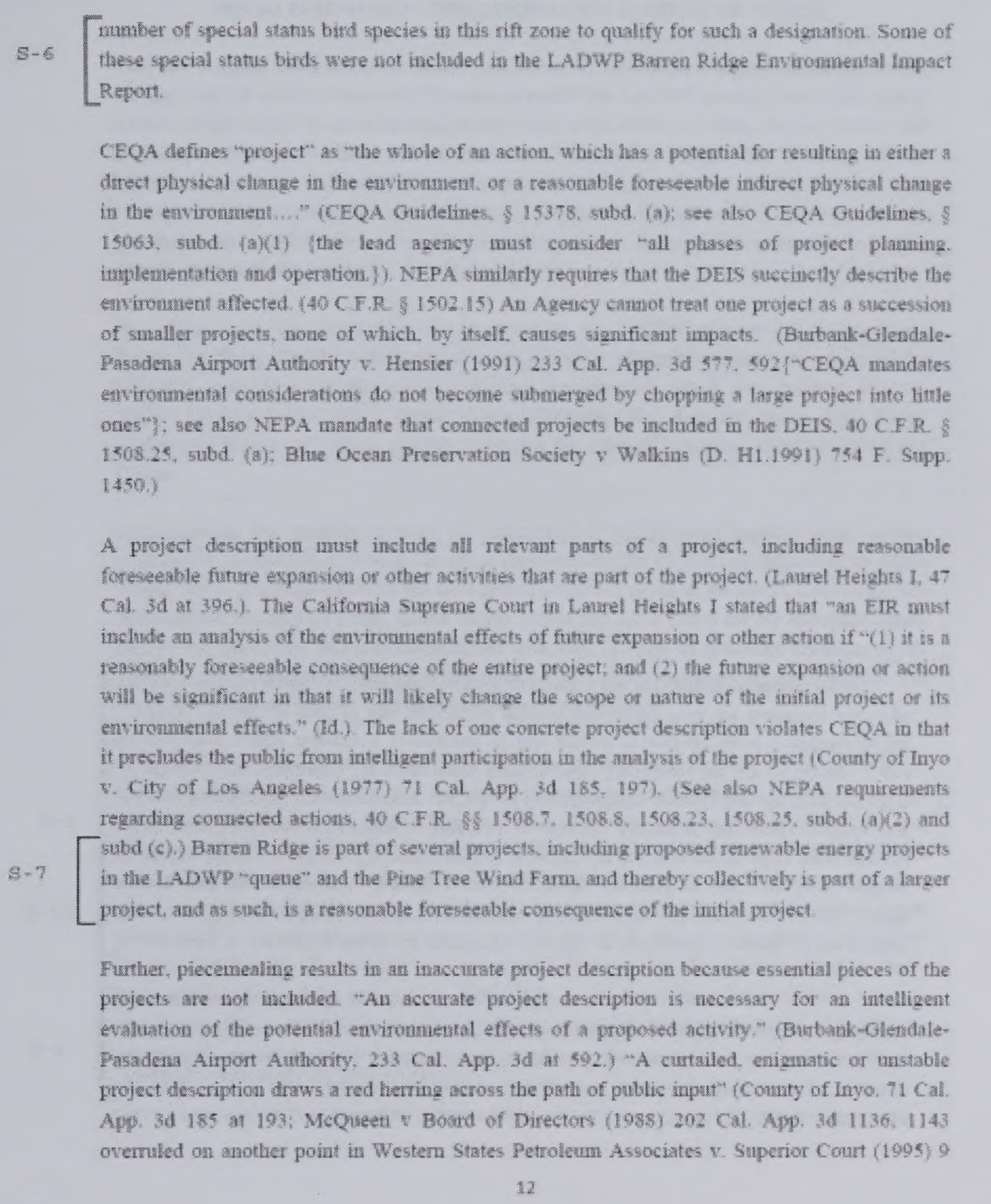

S-6 number of special status bird species in this rift zone to qualify for such a designation. Some of these special status birds were not included in the LADWP Barren Ridge Environmental Impact Report.

CEQA defines "project" as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonable foreseeable indirect physical change in the environment…." (CEQA Guidelines, § 15378, subd. (a); see also CEQA Guidelines, § 15063, subd. (a)(1) {the lead agency must consider "all phases of project planning, implementation and operation.}). NEPA similarly requires that the DEIS succinctly describe the environment affected. (40 C.F.R. § 1502.15) An Agency cannot treat one project as a succession of smaller projects, none of which, by itself, causes significant impacts. (Burbank-Glendale-Pasadena Airport Authority v. Hensier (1991) 233 Cal. App. 3d 577, 592{"CEQA mandates environmental considerations do not become submerged by chopping a large project into little ones"}; see also NEPA mandate that connected projects be included in the DEIS, 40 C.F.R. § 1508.25, subd. (a); Blue Ocean Preservation Society v Walkins (D. H1.1991) 754 F. Supp. 1450.)

A project description must include all relevant parts of a project, including reasonable foreseeable future expansion or other activities that are part of the project. (Laurel Heights I, 47 Cal. 3d at 396.). The California Supreme Court in Laurel Heights I stated that "an EIR must include an analysis of the environmental effects of future expansion or other action if "(1) it is a reasonably foreseeable consequence of the entire project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects." (Id.). The lack of one concrete project description violates CEQA in that it precludes the public from intelligent participation in the analysis of the project (County of Inyo v. City of Los Angeles (1977) 71 Cal. App. 3d 185, 197). (See also NEPA requirements regarding connected actions, 40 C.F.R. §§ 1508.7, 1508.8, 1508.23, 1508.25, subd. (a)(2) and
S-7 subd (c).) Barren Ridge is part of several projects, including proposed renewable energy projects in the LADWP "queue" and the Pine Tree Wind Farm, and thereby collectively is part of a larger project, and as such, is a reasonable foreseeable consequence of the initial project.

Further, piecemealing results in an inaccurate project description because essential pieces of the projects are not included. "An accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity." (Burbank-Glendale-Pasadena Airport Authority, 233 Cal. App. 3d at 592.) "A curtailed, enigmatic or unstable project description draws a red herring across the path of public input" (County of Inyo, 71 Cal. App. 3d 185 at 193; McQueen v Board of Directors (1988) 202 Cal. App. 3d 1136, 1143 overruled on another point in Western States Petroleum Associates v. Superior Court (1995) 9

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Response S-6: An analysis of additional birds has been added to the Final EIS/EIR, Section 4.3.1, including an analysis of the potential to occur on each segment/alternative, respectively, and potential Project impacts. Based on the most current (November 2011) California Natural Diversity Database data of special-status species that have been recorded in the BRRTP area, this will include tricolored blackbird, grasshopper sparrow, mountain plover, white-tailed kite, and Le Conte's thrasher.

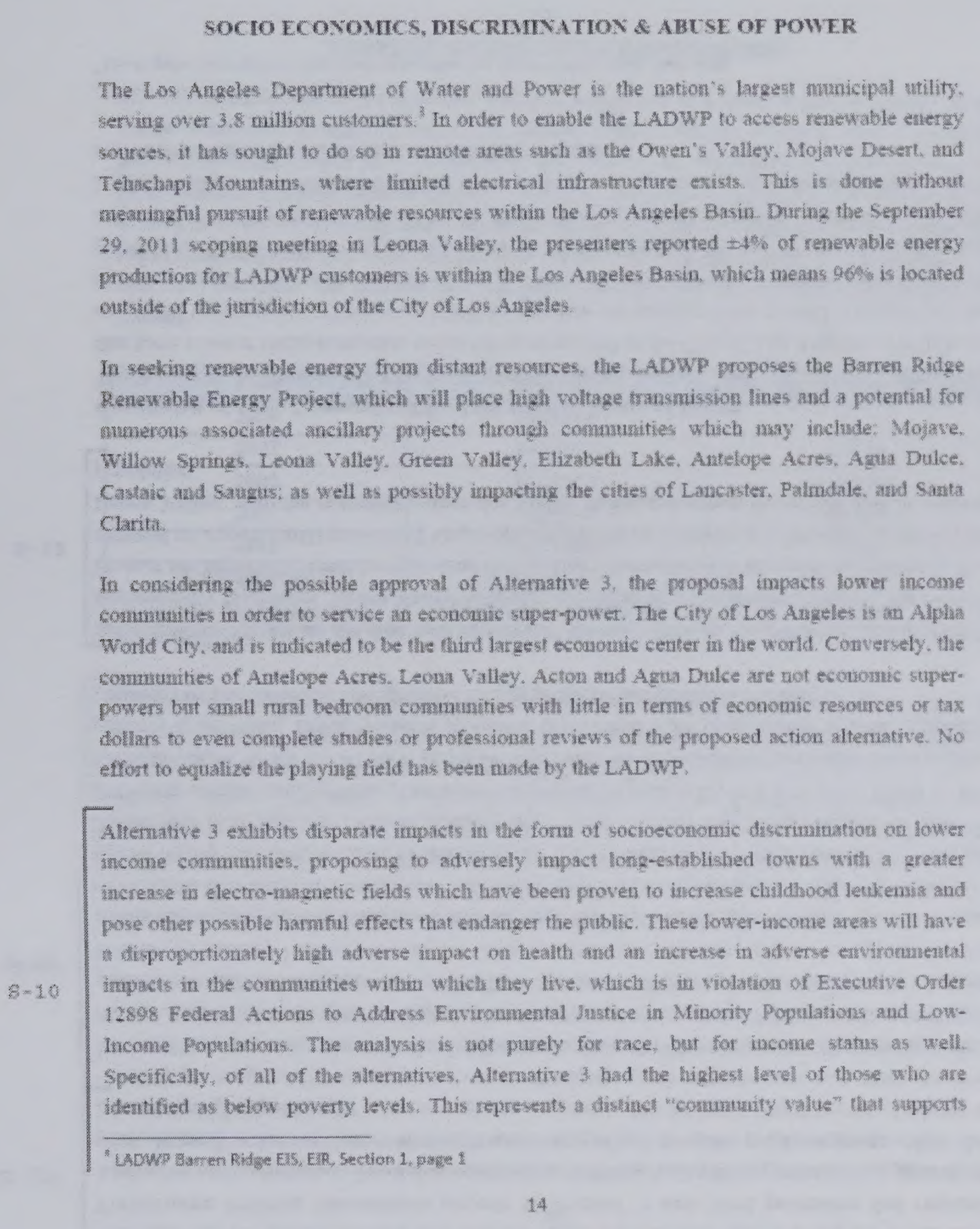
Response S-7: The Pine Tree Wind Farm Project is addressed in Chapter 5, Cumulative Effects of the Draft and Final EIS/EIR. Refer to Response S-3 above.

Cal. 4th 559, 570, fn 2; Mira Monte Homeowner's Association v County of Ventura (1985) 165 Cal. App. 3d 357, 365.). Because the project description is limited by piecemealing, the public and decision makers are being deprived of the ability to understand impacts from the synergistic effects, conflicts and cumulative impacts of all of the collective projects associated with Barren Ridge and the Tehachapi Renewable Energy projects. S-8

In summary, in reviewing either the Project as a whole, or individual elements of the project, there is sufficient evidence to support a finding that all of the elements are part of a whole project, and that individual elements cannot be easily removed or not considered without disrupting the entire project. The entire project is in fact the government mandate for renewable energy that each power provider is required to achieve. Therefore, we must conclude that piecemealing as well as an improper analysis of the cumulative impacts has occurred, which is violation of the California Environmental Quality Act. Therefore, the Leona Valley Town Council respectfully requests a re-analysis of this project to include those proposals in the LADWP "queue" as well as the cumulative impacts associated with the numerous Antelope Valley renewable energy projects that were not included in the environmental impact report. S-9

Response S-8: The cumulative effects analysis contained in all of Chapter 5 is reasonable and adequate for decision-making, and is not piecemealed. New projects have been added to the cumulative effects analysis (refer to the updated Table 5-1) in the Final EIS/EIR. Therefore, the decision-makers are adequately and appropriately informed about Project impacts from the analysis contained in the Draft EIS/EIR, the public comments on that document, and the Final EIS/EIR.

Response S-9: The Project has been defined in Chapter 2 under Section 2.4, Proposed Action, of the Final EIS/EIR. The Project is not a government mandate for renewable energy, and cumulative effects have been adequately addressed. Refer to Responses S-2, S-3, S-5, and S-8 above.



SOCIO ECONOMICS, DISCRIMINATION & ABUSE OF POWER

The Los Angeles Department of Water and Power is the nation's largest municipal utility, serving over 3.8 million customers.[3] In order to enable the LADWP to access renewable energy sources, it has sought to do so in remote areas such as the Owen's Valley, Mojave Desert, and Tehachapi Mountains, where limited electrical infrastructure exists. This is done without meaningful pursuit of renewable resources within the Los Angeles Basin. During the September 29, 2011 scoping meeting in Leona Valley, the presenters reported ±4% of renewable energy production for LADWP customers is within the Los Angeles Basin, which means 96% is located outside of the jurisdiction of the City of Los Angeles.

In seeking renewable energy from distant resources, the LADWP proposes the Barren Ridge Renewable Energy Project, which will place high voltage transmission lines and a potential for numerous associated ancillary projects through communities which may include: Mojave, Willow Springs, Leona Valley, Green Valley, Elizabeth Lake, Antelope Acres, Agua Dulce, Castaic and Saugus; as well as possibly impacting the cities of Lancaster, Palmdale, and Santa Clarita.

In considering the possible approval of Alternative 3, the proposal impacts lower income communities in order to service an economic super-power. The City of Los Angeles is an Alpha World City, and is indicated to be the third largest economic center in the world. Conversely, the communities of Antelope Acres, Leona Valley, Acton and Agua Dulce are not economic super-powers but small rural bedroom communities with little in terms of economic resources or tax dollars to even complete studies or professional reviews of the proposed action alternative. No effort to equalize the playing field has been made by the LADWP.

S-10 Alternative 3 exhibits disparate impacts in the form of socioeconomic discrimination on lower income communities, proposing to adversely impact long-established towns with a greater increase in electro-magnetic fields which have been proven to increase childhood leukemia and pose other possible harmful effects that endanger the public. These lower-income areas will have a disproportionately high adverse impact on health and an increase in adverse environmental impacts in the communities within which they live, which is in violation of Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The analysis is not purely for race, but for income status as well. Specifically, of all of the alternatives, Alternative 3 had the highest level of those who are identified as below poverty levels. This represents a distinct "community value" that supports

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[3] LADWP Barren Ridge EIS, EIR, Section 1, page 1

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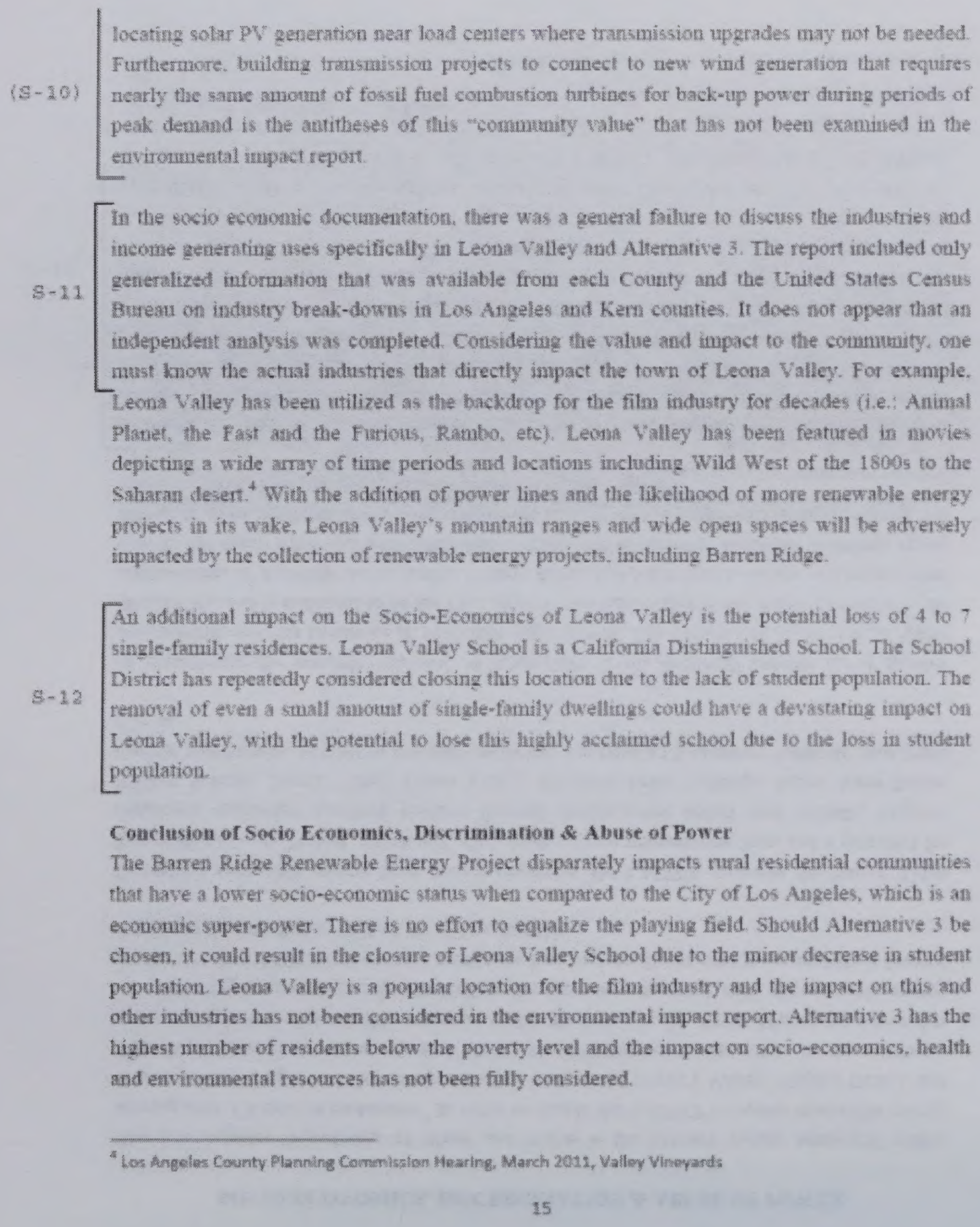
Response S-10: Per the requirements of Executive Order 12898, the environmental justice analysis in the Draft EIS/EIR did address both low-income and minority populations. The Draft EIS/EIR showed that the Project alternatives all traverse areas with generally lower proportions of minority and low-income persons than the Project region as a whole. It also indicated that, of the Alternatives, Alternative 3 had a population of Census Block Groups within six miles that had slightly higher proportions of low-income and minority populations than Alternatives 1, 2, and 2a. See Section 6.6.12 in Chapter 6 of the Final EIS/EIR for a full description of the environmental justice analysis.

The closer examination of the populations within six miles of Project alternative routes, conducted in response to the comments received on the Draft EIS/EIR, indicates that one possible adverse impact on environmental justice communities could occur for Alternative 3 that would not occur for Alternatives 1, 2, or 2a (on low-income communities in Census Block Group 1, Census Tract 9102.05, which would be traversed by Alternative 3 facilities), but that this impact would be, at most, moderate. Some potential for previous and/or ongoing impacts on environmental justice communities by existing transmission lines in the Project area may exist. No other potential adverse impacts on environmental justice communities for any alternative were identified.

The environmental justice evaluation is one of many factors included in the EIS/EIR that provide for comparison between Alternatives. This information will be considered during the decision-making process.

A Solar Generation Alternative that would locate generation near the load center was considered but eliminated from detailed evaluation because it would not meet the Project purpose and need. Refer to the Alternatives Development Report, included as



(S-10) locating solar PV generation near load centers where transmission upgrades may not be needed. Furthermore, building transmission projects to connect to new wind generation that requires nearly the same amount of fossil fuel combustion turbines for back-up power during periods of peak demand is the antitheses of this "community value" that has not been examined in the environmental impact report.

S-11 In the socio economic documentation, there was a general failure to discuss the industries and income generating uses specifically in Leona Valley and Alternative 3. The report included only generalized information that was available from each County and the United States Census Bureau on industry break-downs in Los Angeles and Kern counties. It does not appear that an independent analysis was completed. Considering the value and impact to the community, one must know the actual industries that directly impact the town of Leona Valley. For example, Leona Valley has been utilized as the backdrop for the film industry for decades (i.e.: Animal Planet, the Fast and the Furious, Rambo, etc). Leona Valley has been featured in movies depicting a wide array of time periods and locations including Wild West of the 1800s to the Saharan desert.[4] With the addition of power lines and the likelihood of more renewable energy projects in its wake, Leona Valley's mountain ranges and wide open spaces will be adversely impacted by the collection of renewable energy projects, including Barren Ridge.

S-12 An additional impact on the Socio-Economics of Leona Valley is the potential loss of 4 to 7 single-family residences. Leona Valley School is a California Distinguished School. The School District has repeatedly considered closing this location due to the lack of student population. The removal of even a small amount of single-family dwellings could have a devastating impact on Leona Valley, with the potential to lose this highly acclaimed school due to the loss in student population.

Conclusion of Socio Economics, Discrimination & Abuse of Power

The Barren Ridge Renewable Energy Project disparately impacts rural residential communities that have a lower socio-economic status when compared to the City of Los Angeles, which is an economic super-power. There is no effort to equalize the playing field. Should Alternative 3 be chosen, it could result in the closure of Leona Valley School due to the minor decrease in student population. Leona Valley is a popular location for the film industry and the impact on this and other industries has not been considered in the environmental impact report. Alternative 3 has the highest number of residents below the poverty level and the impact on socio-economics, health and environmental resources has not been fully considered.

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[4] Los Angeles County Planning Commission Hearing, March 2011, Valley Vineyards

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Appendix B to the Final EIS/EIR, and Chapter 2 of the Final EIS/EIR, page 2-14, for a full discussion of this alternative.

Response S-11: Your comment is acknowledged, and additional information is provided below. Films, television productions, documentaries, commercials, and multimedia productions shot on location in the area of Leona Valley and other communities on occasion contribute to the areas' economies for their duration (typically days to months). They provide job opportunities because companies often hire local residents for their production teams, and film workers coming to the area for the time of their assignments patronize local businesses such as hotels, restaurants, and miscellaneous retail and rental establishments.

Filming is subject to permitting by the Kern County Film Commission, Los Angeles County, and the incorporated communities in the study area.

FilmLA, a nonprofit organization, acts as ombudsman for filmmakers and localities in Los Angeles County (coordinating permitting and production), and reports 43,646 Permitted Production Days in which it participated in 2010 (FilmLA 2011). Actual production days in Los Angeles County, including those outside the purview of FilmLA, are likely much higher, and location scouting activities are not included in the day count.

Data for Kern County are not compiled on an identical basis as those for Los Angeles County, but are indicative of general use of the area for filming. In 2010, there were 382 days (208 projects) of production in Kern County. In what the Kern County Film Commission calls the Aerospace Valley (Tehachapi, Rosamond, Mojave, California City, Boron, Edwards AFB, and the Antelope Valley side of Tejon Ranch), 116 shoot dates were counted in 2010. Employment estimates are not available, but the Association

EMINENT DOMAIN AND COMPENSATION

The real estate market in the Antelope Valley is comprised of a boom or bust economy. When market conditions are appreciating in Los Angeles County, the rate of appreciation is generally good in the North County area. However, in the "bust" cycle, the Antelope Valley declines at a far greater rate and level than the County as a whole. We are presently in a historically weak real estate cycle and the economy in the Antelope Valley is extremely depressed, with a higher per capita unemployment rate when compared to the State or even the County of Los Angeles. The following illustrates the trend in housing prices for zip code 93551, where Alternative 3 is located:

Year	Median Price	% Change from Prior Year
2006	$435,000	
2007	$409,000	-5.98%
2008	$260,000	-36.43%
2009	$210,000	-19.23%
2010	$211,000	.48%
September 2011	$207,000	-1.9%
2006 vs. September 2011	$435,000 vs. $207,000	-52.43%

Source: Dataquick

S-13 For the Barren Ridge Renewable Energy Transmission Project, home and land that is taken by eminent domain is compensated in terms of "fair market value". This is defined as, "The fair market value of the property taken is the highest price on the date of valuation that would be agreed to by the seller, being willing to sell but under no particular or urgent necessity for doing, nor obliged to sell, and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available." However, there are several issues that are not addressed relative to compensation and eminent domain.

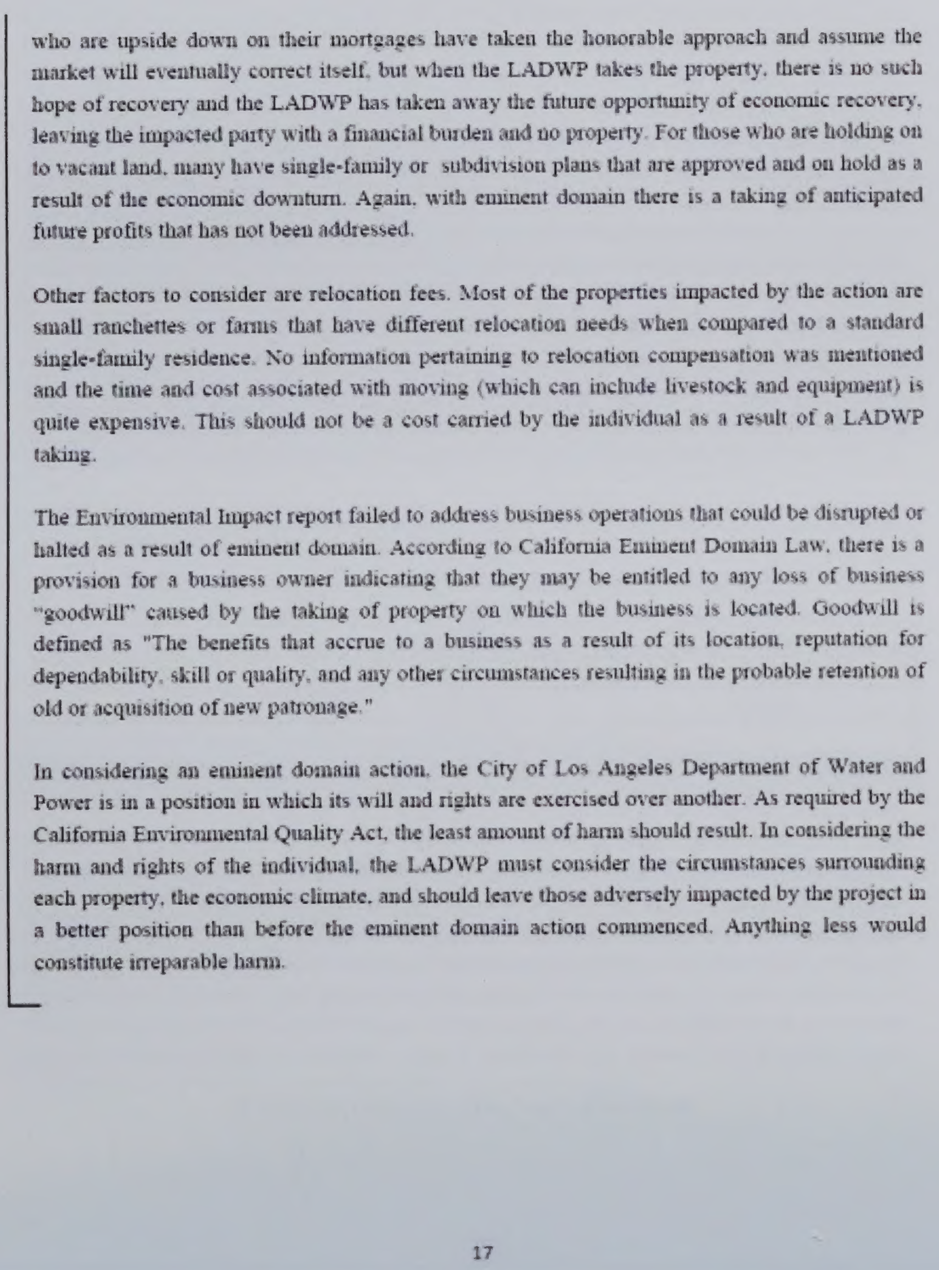
Because of the dramatic decline in property values, many land owners and homeowners owe more on their property than what the property is worth in terms of fair market value. While it had been repeated at our most recent scoping meeting that those properties taken by eminent domain would be justly compensated based on an appraisal, those citizens who owe more on their properties than fair market value will still owe a bank or private party lender (which is typical on vacant land) with a remaining mortgage balance. The fact is, these individuals will suffer as a result of the "taking" and will continue to pay on property that they no longer own. Often those

of Film Commissions International estimated total benefits to the local economy of $4.3 million from these 116 days (David Hook 2011). This averages to a $37,000 benefit per day, or about the same as the average annual pay of 0.7 day of the average county job in Los Angeles County in 2008 of $52,810 (U.S. Department of Commerce 2010).

To the extent that location shooting depends on scenery that lacks visible signs of modern settlement (such as electric transmission lines), which cannot readily be edited out in film production, development of any action Alternative would result in adverse impacts on local employment and income potential. This impact is assessed as noticeable, but not significant, due to its sporadic and temporary nature and relatively small impact on jobs and income in the study area. It is not possible to rank the Project Alternatives as to their impact on employment and income potential from the film and visual media industry due to a lack of published specific on-location data.

Response S-12: Removal of these single-family residences would not be avoided if Alternative 3 was selected in the decision process. While Alternative 3 was designed to minimize potential take of private residences (see page 2-114 in Chapter 2 of the Final EIS/EIR for a description of the Avenue L Re-Route), due to design and feasibility constraints, impacts to private residences would be unavoidable if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the preferred Alternative. Your comment will be considered during the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response S-13: Please refer to Chapter 2, Section 2.4.2, of the Final EIS/EIR, Right-of-Way Permits and Grants, for information regarding property acquisition and to Chapter 4, Section 4.2.3, of



who are upside down on their mortgages have taken the honorable approach and assume the market will eventually correct itself, but when the LADWP takes the property, there is no such hope of recovery and the LADWP has taken away the future opportunity of economic recovery, leaving the impacted party with a financial burden and no property. For those who are holding on to vacant land, many have single-family or subdivision plans that are approved and on hold as a result of the economic downturn. Again, with eminent domain there is a taking of anticipated future profits that has not been addressed.

Other factors to consider are relocation fees. Most of the properties impacted by the action are small ranchettes or farms that have different relocation needs when compared to a standard single-family residence. No information pertaining to relocation compensation was mentioned and the time and cost associated with moving (which can include livestock and equipment) is quite expensive. This should not be a cost carried by the individual as a result of a LADWP taking.

(S-13)

The Environmental Impact report failed to address business operations that could be disrupted or halted as a result of eminent domain. According to California Eminent Domain Law, there is a provision for a business owner indicating that they may be entitled to any loss of business "goodwill" caused by the taking of property on which the business is located. Goodwill is defined as "The benefits that accrue to a business as a result of its location, reputation for dependability, skill or quality, and any other circumstances resulting in the probable retention of old or acquisition of new patronage."

In considering an eminent domain action, the City of Los Angeles Department of Water and Power is in a position in which its will and rights are exercised over another. As required by the California Environmental Quality Act, the least amount of harm should result. In considering the harm and rights of the individual, the LADWP must consider the circumstances surrounding each property, the economic climate, and should leave those adversely impacted by the project in a better position than before the eminent domain action commenced. Anything less would constitute irreparable harm.

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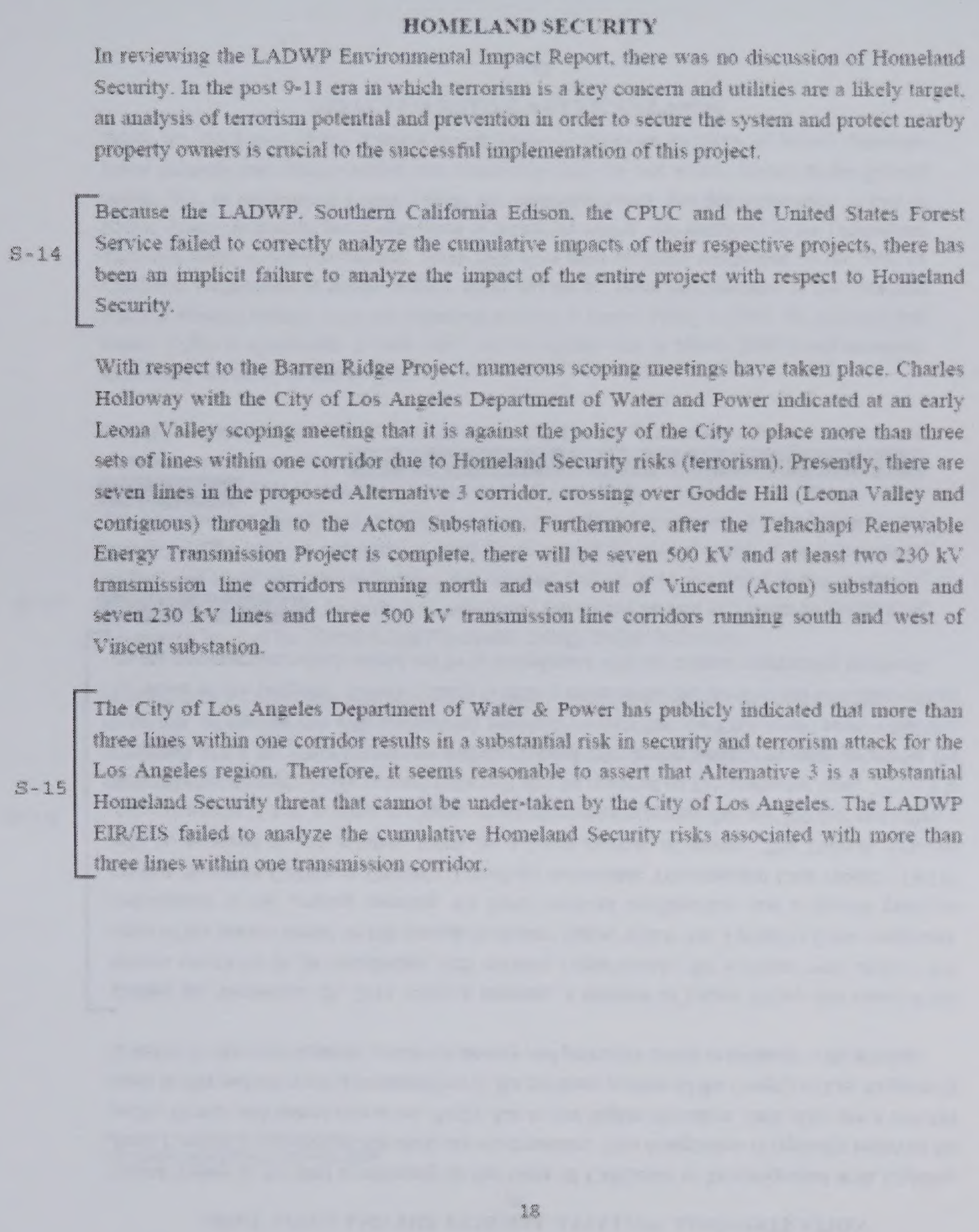
the Final EIS/EIR for the analysis of potential impacts. There is currently no mechanism to specifically address additional payoff for properties valued at less than is owed on the mortgage. When necessary, relocation fees are provided by the City of Los Angeles. Should LADWP be forced to condemn certain of the land parcels running along the selected transmission line route, the California Eminent Domain Law (contained in the California Code of Civil Procedure, 1230.010 – 1273.050) covers, in great detail, the procedural aspects of bringing eminent domain action in court including provision for lost business opportunities as appropriate. In an eminent domain action, the only issue tried before a jury is valuation, whereas all other issues (e.g., the right to take the property) are tried by the court (*People v. Volz*, 1972. 25 Cal. App.3d 480,487). Alternative 2, which is identified by the lead agencies as the preferred alternative, would not involve the acquisition of any residences or the displacement of any residents. Only Alternative 3 would have the potential to result in take of homes through eminent domain, and this potential was considered in the decision not to select Alternative 3 as the Federal Agency Preferred Alternative.



HOMELAND SECURITY

In reviewing the LADWP Environmental Impact Report, there was no discussion of Homeland Security. In the post 9-11 era in which terrorism is a key concern and utilities are a likely target, an analysis of terrorism potential and prevention in order to secure the system and protect nearby property owners is crucial to the successful implementation of this project.

S-14 Because the LADWP, Southern California Edison, the CPUC and the United States Forest Service failed to correctly analyze the cumulative impacts of their respective projects, there has been an implicit failure to analyze the impact of the entire project with respect to Homeland Security.

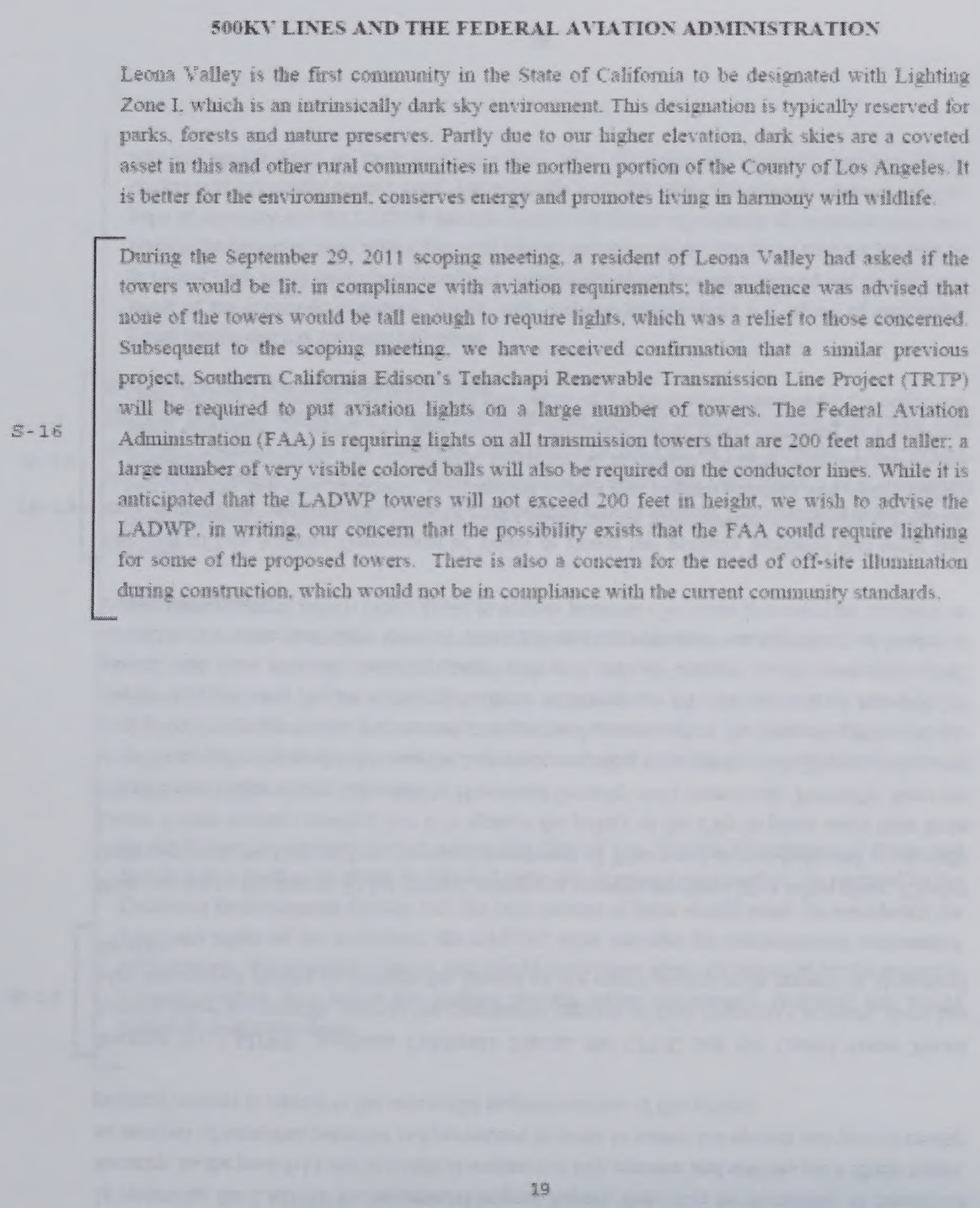
With respect to the Barren Ridge Project, numerous scoping meetings have taken place. Charles Holloway with the City of Los Angeles Department of Water and Power indicated at an early Leona Valley scoping meeting that it is against the policy of the City to place more than three sets of lines within one corridor due to Homeland Security risks (terrorism). Presently, there are seven lines in the proposed Alternative 3 corridor, crossing over Godde Hill (Leona Valley and contiguous) through to the Acton Substation. Furthermore, after the Tehachapi Renewable Energy Transmission Project is complete, there will be seven 500 kV and at least two 230 kV transmission line corridors running north and east out of Vincent (Acton) substation and seven 230 kV lines and three 500 kV transmission line corridors running south and west of Vincent substation.

S-15 The City of Los Angeles Department of Water & Power has publicly indicated that more than three lines within one corridor results in a substantial risk in security and terrorism attack for the Los Angeles region. Therefore, it seems reasonable to assert that Alternative 3 is a substantial Homeland Security threat that cannot be under-taken by the City of Los Angeles. The LADWP EIR/EIS failed to analyze the cumulative Homeland Security risks associated with more than three lines within one transmission corridor.

18

Response S-14: Please refer to Response S-3 regarding cumulative impacts and Response S-2 regarding the definition of the Project. LADWP operates under specific regulations addressing homeland security issues, and as such the Project has been under such scrutiny from its inception several years ago.

Response S-15: It is not accurate that more than three lines within a single corridor would result in a substantial risk to homeland security. Reliability has been carefully evaluated during Project design using LADWP's criteria for all alternatives as described in Section 2.2 of the Final EIS/EIR. Potential alternatives that would not meet the Project Purpose and Need/Objectives, including to increase LADWP's system reliability and flexibility, were eliminated from detailed evaluation in the EIS/EIR. All action Alternatives considered in the EIS/EIR would result in the condition of three or more lines being located within a single corridor in some areas.



500KV LINES AND THE FEDERAL AVIATION ADMINISTRATION

Leona Valley is the first community in the State of California to be designated with Lighting Zone I, which is an intrinsically dark sky environment. This designation is typically reserved for parks, forests and nature preserves. Partly due to our higher elevation, dark skies are a coveted asset in this and other rural communities in the northern portion of the County of Los Angeles. It is better for the environment, conserves energy and promotes living in harmony with wildlife.

S-16 During the September 29, 2011 scoping meeting, a resident of Leona Valley had asked if the towers would be lit, in compliance with aviation requirements; the audience was advised that none of the towers would be tall enough to require lights, which was a relief to those concerned. Subsequent to the scoping meeting, we have received confirmation that a similar previous project, Southern California Edison's Tehachapi Renewable Transmission Line Project (TRTP) will be required to put aviation lights on a large number of towers. The Federal Aviation Administration (FAA) is requiring lights on all transmission towers that are 200 feet and taller; a large number of very visible colored balls will also be required on the conductor lines. While it is anticipated that the LADWP towers will not exceed 200 feet in height, we wish to advise the LADWP, in writing, our concern that the possibility exists that the FAA could require lighting for some of the proposed towers. There is also a concern for the need of off-site illumination during construction, which would not be in compliance with the current community standards.

Response S-16: FAA regulations (14 C.F.R. part 77) establish standards for determining obstructions in navigable airspace if the project meets criteria detailed in FAA Form 7460-1 (Notice of Proposed Construction or Alteration), including the construction of structures that are taller than 200 feet or within 20,000 feet of an airport. As part of the Form 7460-1 filing, final engineering that would include precise structure locations, ground surface elevations, and design height for each structure is necessary. After Form 7460-1 submittal, the FAA would conduct an aeronautical study to determine potential hazards and requirements for visual marking.

While specific locations of required markers cannot be determined prior to final design, obstruction marking for aircraft safety is expected to occur in only limited locations on conductor spans over major drainages or canyons. Based on preliminary design, no transmission line towers are expected to exceed 200 feet in height or trigger FAA requirements for obstruction marking or lighting.

A discussion of the implementation of these FAA requirements has been added to description of the Proposed Action in Chapter 2, Section 2.4,2, page 2-76 of the Final EIS/EIR, and potential impacts are discussed in Chapter 4, Section 4.2.1, Air Quality, Section 4.22, Noise, Section 4.29, Visual Resources, and Section 4.3.1, Biological Resources. As stated in the Final EIS/EIR, LADWP would consult with the FAA to ensure Project compliance with FAA lighting and marking requirements.

Off-site illumination may be required during construction in staging, yarding, and construction management areas dedicated to the Project. The locations of the areas would be determined by the contractor selected after final engineering, and may be on private property within the Leona Valley Community Standards District. Illumination of these areas would only occur for short durations in

IMPACT ON NATIVE AMERICAN LANDS

While we, the Leona Valley Town Council, know of the exact locations of Native American burial grounds and villages within our community they are not widely known to the general public. We, as residents of Leona Valley, are intimately aware that this community is rich in Native American history, but is also home to numerous sacred sites attributed to the Fernandeno Tataviam Band of Mission Indians. Some sites have been officially designated by the State of California Department of Indian Affairs. Rudy Ortega Jr., tribal administrator of the Tataviam Band of Mission Indians inspected numerous artifacts in Leona Valley in 2008. He indicated that Leona Valley is specifically a "rich area" and during his visit in March 2008 found numerous stones that had been worked by man.[5]

During the construction of the Tehachapi Renewable Energy Transmission Project, artifacts and skeletal remains were found [redacted] This is now the proposed right of way for the LADWP Barren Ridge Project. The discovery and disturbance of skeletal remains and artifacts resulted in an extended halt to the project until the remains and artifacts could be accounted for and relocated. A large amount of artifacts and burial grounds attributed to the Tataviam Indians were also found during grading of S-17 [redacted]. As such, it is anticipated that sacred ground will again be disturbed if Alternative No. 3 of the Barren Ridge Renewable Energy Project is chosen.

Alternative No. 3 is the only alternative that impacts a significant portion of a community known for sacred burial grounds and undisturbed Native American artifacts. As such, we consider Alternative No. 3 the least viable of the proposed actions due to the probable adverse impact on Tataviam sacred lands.

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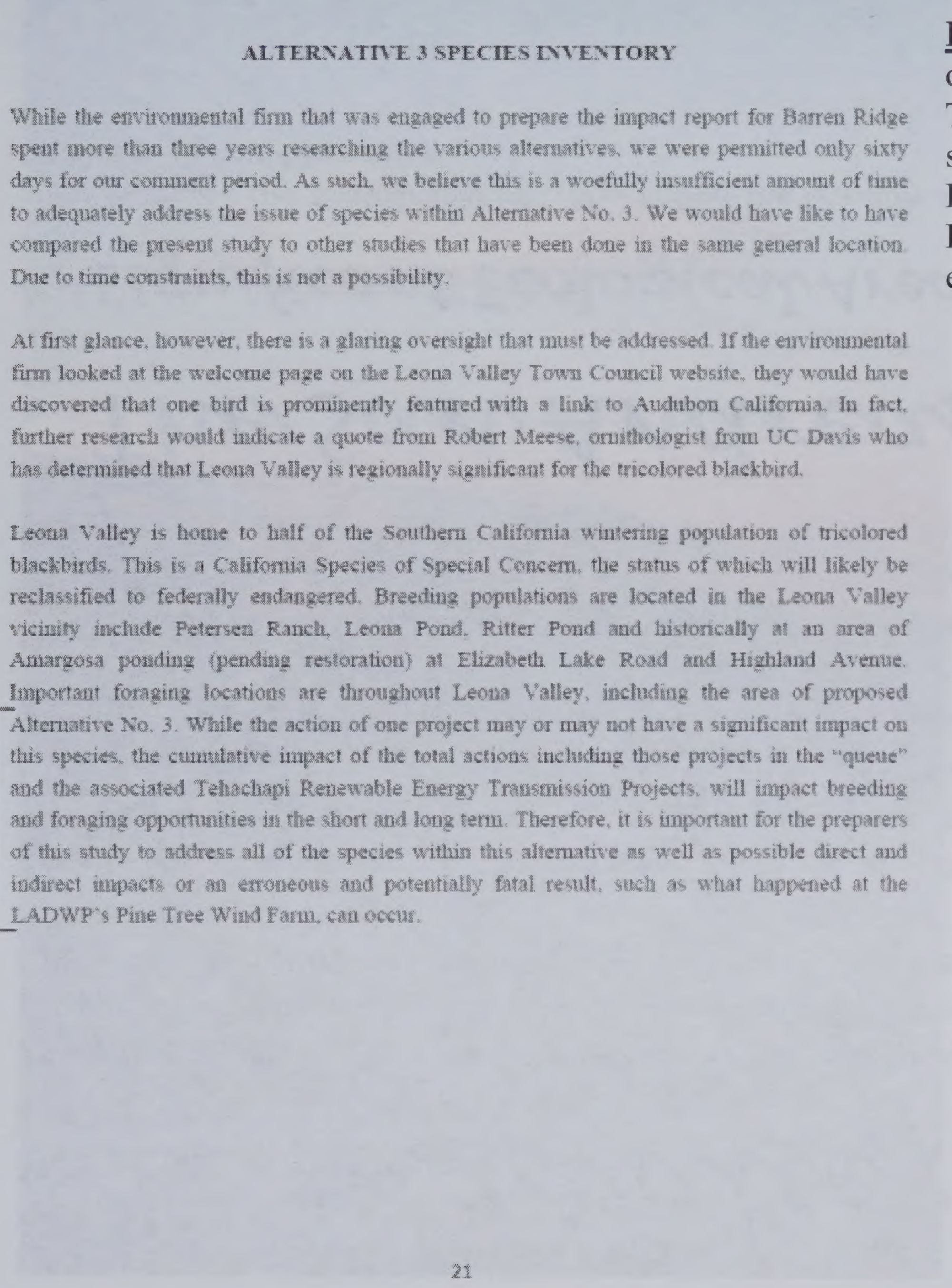
[5] Antelope Valley Press, March 8, 2008

the early evening hours because construction activities would occur during daylight hours and lighting would only be necessary at the end of the regular working day during seasons of shorter daylight. Leona Valley Community Standards District Community-Wide Development Standards state that lighting on private parcels shall be designed to prevent off-site illumination. To minimize lighting impacts and as stated in the Draft EIS/EIR, mitigation measure VIS-8 (Reduce Glare and Light Spill) would be implemented to reduce the effects of lighting required to meet minimum safety and security standards, and light fixture hoods, sensors, and switches to regulate lighting would be used during Project construction.

Response S-17: *[Note: Information on the specific locations of cultural resources is confidential and cannot be made available to the public. Sensitive information in comment letter S has been redacted.]*
The Angeles National Forest's Native American consultation process for BRRTP is on-going, and input received from federally recognized Tribes and Native American organizations, groups, and individuals will continue to be considered during the impact analysis process, the selection of a route, implementation of mitigation measures, and construction.

The Leona Valley portions of Alternatives 2 (Proposed Action), 2a, and 3 have not yet been surveyed for cultural resources. As discussed in the Final EIS/EIR on page 4-268, the selected alternative would be surveyed in its entirety for cultural resources and appropriate measures would be implemented to evaluate the resources, assess adverse effects, and avoid or mitigate adverse effects per a Programmatic Agreement established for this Project under 36 CFR 800.14(b)(3). The Programmatic Agreement is included as Appendix O in Volume II of the Final EIS/EIR.

Archaeological sites located in the Tehachapi Renewable Transmission Project (TRTP) area in Leona Valley are not likely to be physically affected by BRRTP. BRRTP Alternative 3 would be approximately 1,000 feet from the TRTP ROW, and BRRTP Alternative 2, the Proposed Action, would be over 10 miles from where TRTP crosses Leona Valley.



ALTERNATIVE 3 SPECIES INVENTORY

While the environmental firm that was engaged to prepare the impact report for Barren Ridge spent more than three years researching the various alternatives, we were permitted only sixty days for our comment period. As such, we believe this is a woefully insufficient amount of time to adequately address the issue of species within Alternative No. 3. We would have like to have compared the present study to other studies that have been done in the same general location. Due to time constraints, this is not a possibility.

At first glance, however, there is a glaring oversight that must be addressed. If the environmental firm looked at the welcome page on the Leona Valley Town Council website, they would have discovered that one bird is prominently featured with a link to Audubon California. In fact, further research would indicate a quote from Robert Meese, ornithologist from UC Davis who has determined that Leona Valley is regionally significant for the tricolored blackbird.

Leona Valley is home to half of the Southern California wintering population of tricolored blackbirds. This is a California Species of Special Concern, the status of which will likely be reclassified to federally endangered. Breeding populations are located in the Leona Valley vicinity include Petersen Ranch, Leona Pond, Ritter Pond and historically at an area of Amargosa ponding (pending restoration) at Elizabeth Lake Road and Highland Avenue. Important foraging locations are throughout Leona Valley, including the area of proposed Alternative No. 3. While the action of one project may or may not have a significant impact on this species, the cumulative impact of the total actions including those projects in the "queue" and the associated Tehachapi Renewable Energy Transmission Projects, will impact breeding and foraging opportunities in the short and long term. Therefore, it is important for the preparers of this study to address all of the species within this alternative as well as possible direct and indirect impacts or an erroneous and potentially fatal result, such as what happened at the LADWP's Pine Tree Wind Farm, can occur. S-18

21

Response S-18: As described above in Response S-6, an analysis of tricolored blackbird has been included in the Final EIS/EIR. This includes an analysis of the species' potential to occur on each segment/alternative, respectively, as well an analysis of potential Project impacts for areas where it could occur. Also refer to Response S-3 above for a complete explanation of cumulative effects and the revisions made to the Final EIS.

Leona Valley

It is important to note that the project potentially impacts a rural farming community that enjoys a careful balance between agriculture and wildlife. For more than one-hundred years, this small town has protected its occupants, including the countryside and the creatures that call Leona Valley home. Therefore, it is important for the decision makers to see Leona Valley, not just in a written analysis by environmental experts, but through the eyes of those who live here. Leona Valley is arguably the most picturesque small town in the County of Los Angeles; its biggest asset is its sheer beauty................................. It is:

The San Andreas

Significant Ecological Area

The following are photographs of Leona Valley, the location of the proposed action Alternative

22

Leona Valley Ranch

Leona Valley Ranch

Cottonwood and Willow Woodlands

Open Grasslands

White Crowned Sparrow

Vibrant Habitat

Female Tricolored Blackbird, Native to Leona Valley

Family Farm

Cottonwood in the Summer Landscape

Lark Sparrow

Open Fields

Dark Eyed Junco, Leona Valley's Winter Visitor

Hidden Habitat

Welcoming Watershed

Family Farm

Miles of Untouched Grasslands

A Common House Finch

Welcoming Birds

More Than 1,000 Tricolored Blackbirds Make Leona Valley Their Winter Home

Horse Ranch

Leona Valley: Where Farms and Habitats Live in Harmony

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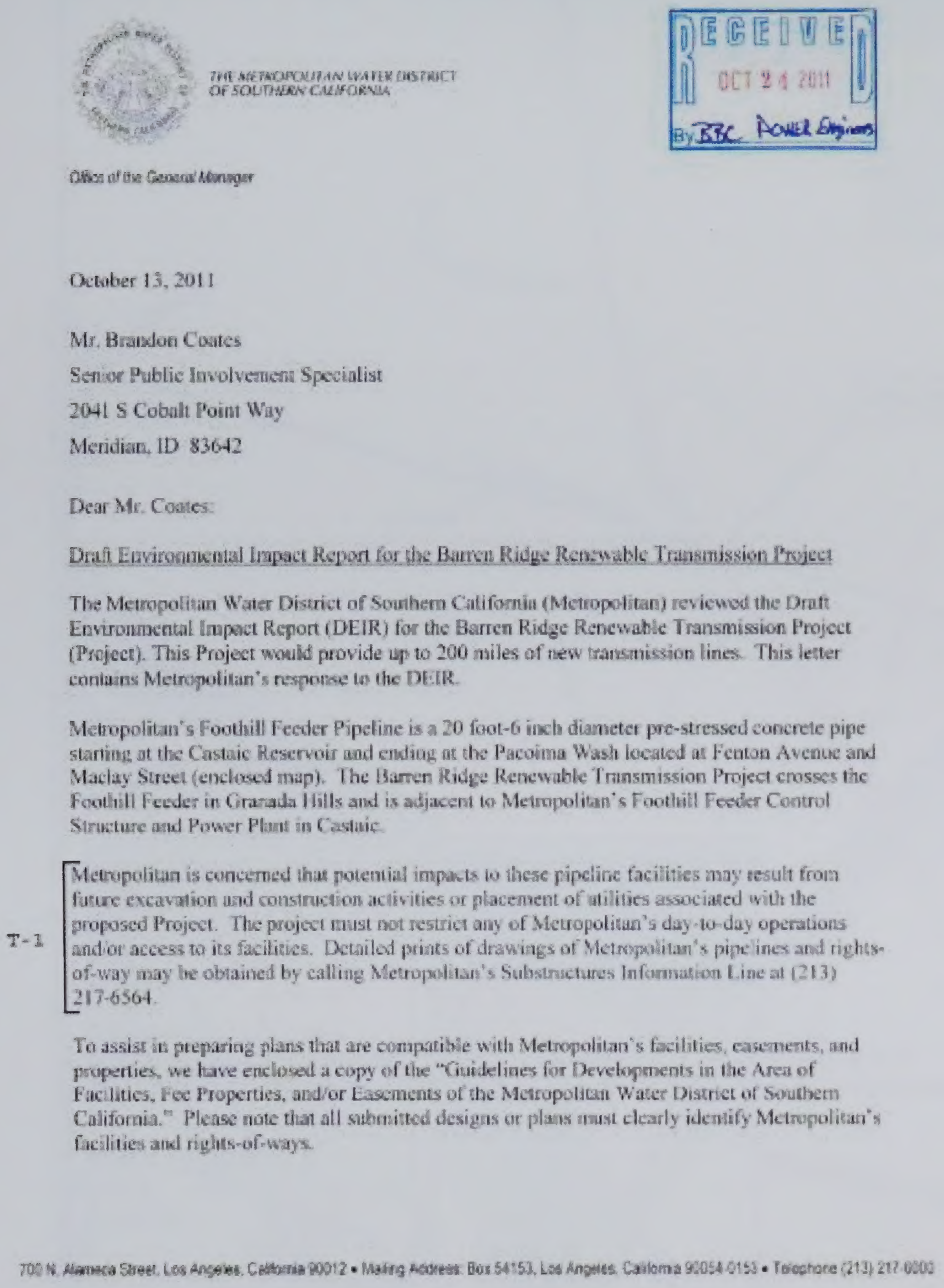
LETTER T: METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Manager

RECEIVED
OCT 24 2011
By BBC Power Engineers

October 13, 2011

Mr. Brandon Coates
Senior Public Involvement Specialist
2041 S Cobalt Point Way
Meridian, ID 83642

Dear Mr. Coates:

Draft Environmental Impact Report for the Barren Ridge Renewable Transmission Project

The Metropolitan Water District of Southern California (Metropolitan) reviewed the Draft Environmental Impact Report (DEIR) for the Barren Ridge Renewable Transmission Project (Project). This Project would provide up to 200 miles of new transmission lines. This letter contains Metropolitan's response to the DEIR.

Metropolitan's Foothill Feeder Pipeline is a 20 foot-6 inch diameter pre-stressed concrete pipe starting at the Castaic Reservoir and ending at the Pacoima Wash located at Fenton Avenue and Maclay Street (enclosed map). The Barren Ridge Renewable Transmission Project crosses the Foothill Feeder in Granada Hills and is adjacent to Metropolitan's Foothill Feeder Control Structure and Power Plant in Castaic.

T-1 Metropolitan is concerned that potential impacts to these pipeline facilities may result from future excavation and construction activities or placement of utilities associated with the proposed Project. The project must not restrict any of Metropolitan's day-to-day operations and/or access to its facilities. Detailed prints of drawings of Metropolitan's pipelines and rights-of-way may be obtained by calling Metropolitan's Substructures Information Line at (213) 217-6564.

To assist in preparing plans that are compatible with Metropolitan's facilities, easements, and properties, we have enclosed a copy of the "Guidelines for Developments in the Area of Facilities, Fee Properties, and/or Easements of the Metropolitan Water District of Southern California." Please note that all submitted designs or plans must clearly identify Metropolitan's facilities and rights-of-ways.

700 N. Alameda Street, Los Angeles, California 90012 • Mailing Address: Box 54153, Los Angeles, California 90054-0153 • Telephone (213) 217-6000

Response T-1: LADWP appreciates the information about the Metropolitan Water District's Foothill Feeder Pipeline. LADWP would work closely with other underground utilities before doing any excavation and ground work, and would contact Metropolitan's Substructure Information Line, as necessary, for information about any planned excavation in the area. At the location where the BRRTP would cross the pipeline you named, the only action that the department intends to do is reconductor an existing set of towers.

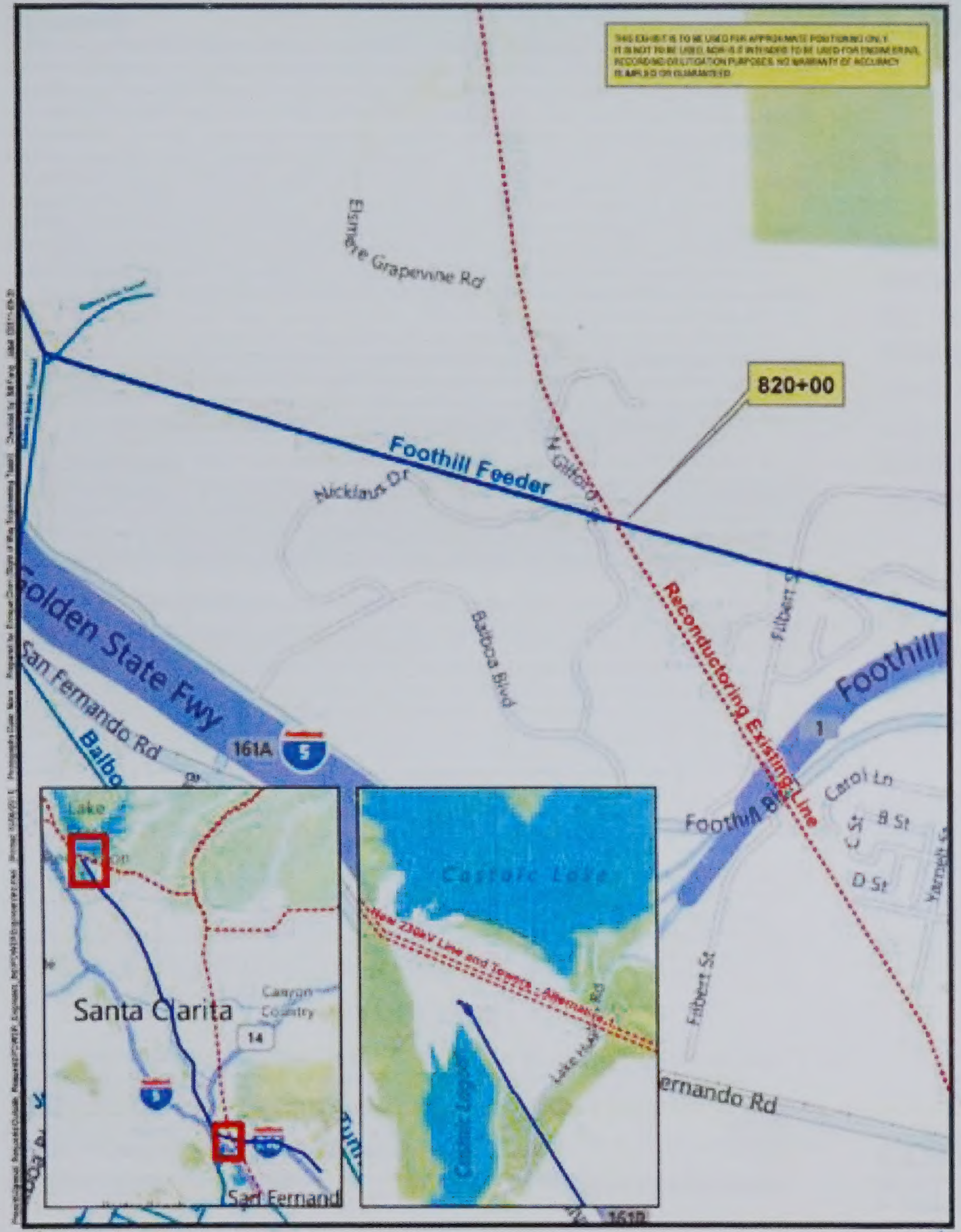
We appreciate the opportunity to provide input to your planning process, and we look forward to further coordination on the Project. If you have any questions, please contact Mr. Kieran Callanan at (213) 217-7474.

Very truly yours,

Deirdre M. West
Manger, Environmental Planning Team

WF/wf
cpt 2011101202

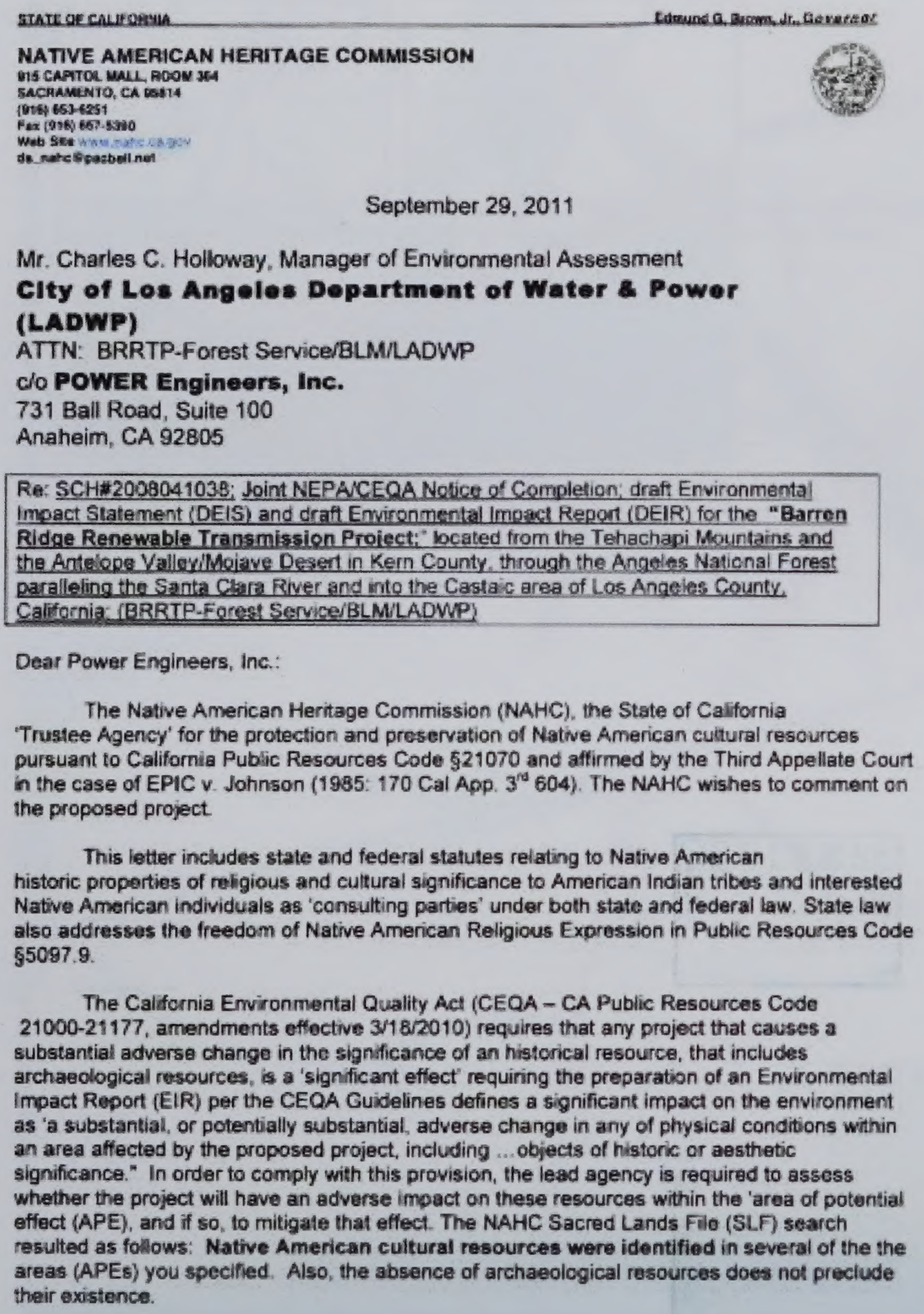
Enclosure


Elsmere Grapevine Rd
820+00
Foothill Feeder
Nicklaus Dr
N Gifford St
Reconductoring Existing Line
Filbert St
Balboa Blvd
Golden State Fwy
San Fernando Rd
Balboa
161A
5
Foothill
1
Foothill Blvd
Carol Ln
B St
C St
D St
Yarnell St
Filbert St
San Fernando Rd
Santa Clarita
Canyon Country
14
5
San Fernand
Castaic Lake
New 230kV Line and Towers - Alternative 1
Lake Hughes Rd
Castaic Lagoon
161B

The Metropolitan Water District of Southern California
Engineering Services Group

Barren Ridge Renewable Transmission Project
Draft EIS/EIR

LETTER U: NATIVE AMERICAN HERITAGE COMMISSION



STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

September 29, 2011

Mr. Charles C. Holloway, Manager of Environmental Assessment
City of Los Angeles Department of Water & Power (LADWP)
ATTN: BRRTP-Forest Service/BLM/LADWP
c/o **POWER Engineers, Inc.**
731 Ball Road, Suite 100
Anaheim, CA 92805

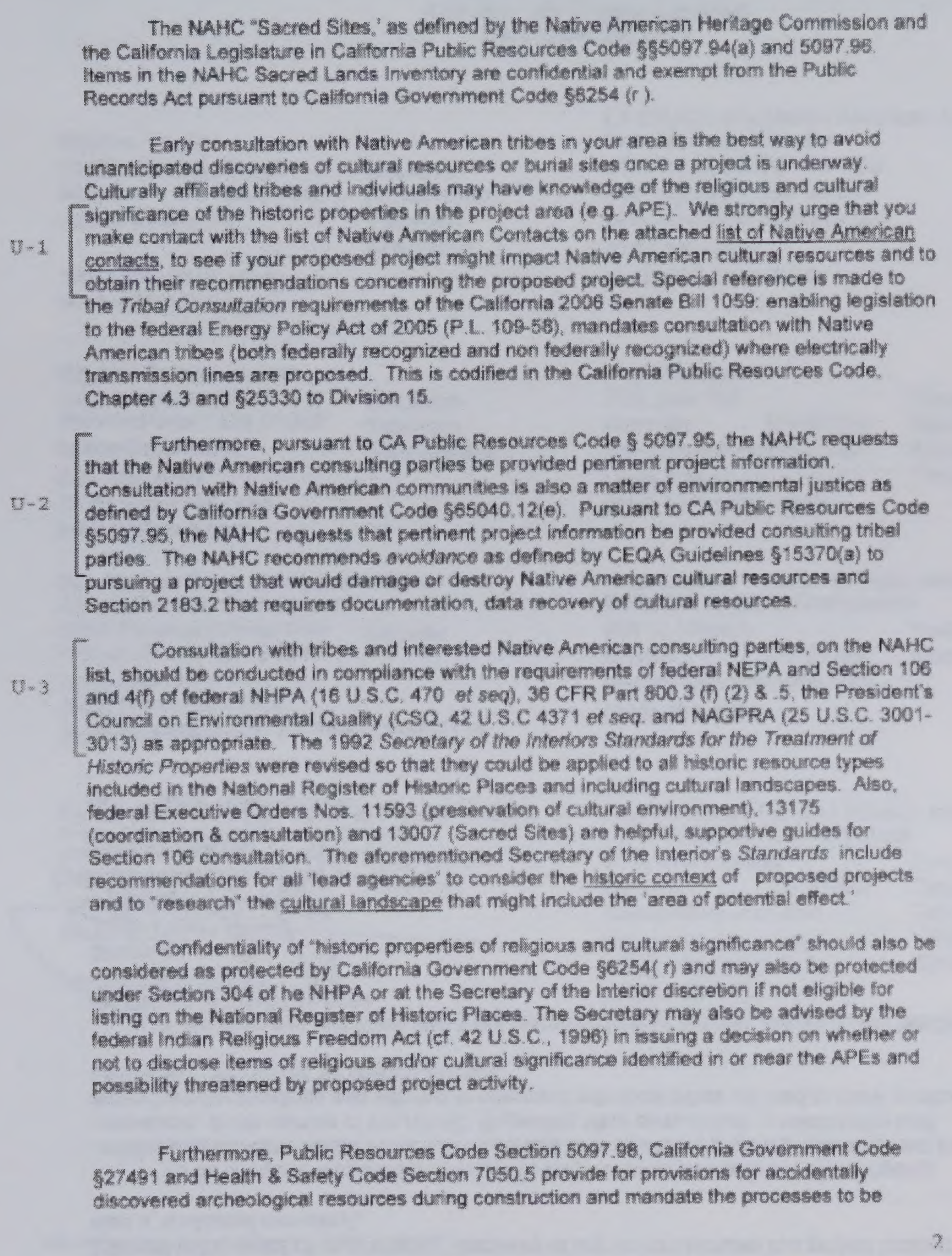
Re: SCH#2008041038; Joint NEPA/CEQA Notice of Completion; draft Environmental Impact Statement (DEIS) and draft Environmental Impact Report (DEIR) for the **"Barren Ridge Renewable Transmission Project;"** located from the Tehachapi Mountains and the Antelope Valley/Mojave Desert in Kern County, through the Angeles National Forest paralleling the Santa Clara River and into the Castaic area of Los Angeles County, California; (BRRTP-Forest Service/BLM/LADWP)

Dear Power Engineers, Inc.:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources pursuant to California Public Resources Code §21070 and affirmed by the Third Appellate Court in the case of EPIC v. Johnson (1985: 170 Cal App. 3rd 604). The NAHC wishes to comment on the proposed project.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9.

The California Environmental Quality Act (CEQA – CA Public Resources Code 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC Sacred Lands File (SLF) search resulted as follows: **Native American cultural resources were identified** in several of the the areas (APEs) you specified. Also, the absence of archaeological resources does not preclude their existence.



The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254 (r).

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). U-1 We strongly urge that you make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. Special reference is made to the *Tribal Consultation* requirements of the California 2006 Senate Bill 1059: enabling legislation to the federal Energy Policy Act of 2005 (P.L. 109-58), mandates consultation with Native American tribes (both federally recognized and non federally recognized) where electrically transmission lines are proposed. This is codified in the California Public Resources Code, Chapter 4.3 and §25330 to Division 15.

U-2 Furthermore, pursuant to CA Public Resources Code § 5097.95, the NAHC requests that the Native American consulting parties be provided pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and Section 2183.2 that requires documentation, data recovery of cultural resources.

U-3 Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq*. and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

Confidentiality of "historic properties of religious and cultural significance" should also be considered as protected by California Government Code §6254(r) and may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity.

Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be

Response U-1: The Final EIS/EIR has been updated with a current explanation of the Tribal concerns on pages 7-19 and 7-20. Please refer to Response U-2 below.

Response U-2: On September 24, 2009, letters were sent by the Angeles National Forest to over 100 Native American Tribes, organizations, groups, and individuals that described BRRTP, discussed the EIS/EIR, and invited the recipient to participate in the development of the Programmatic Agreement (PA). The Notice of Availability (NOA) for the Draft EIS/EIR was mailed to over 70 tribes, Native American organizations, groups, and individuals on August 26, 2011. Refer to Chapter 7 of the Final EIS/EIR for a complete explanation of coordination and consultation activities.

Also, physical avoidance is the ANF's preferred measure for preventing impacts to cultural resources. The Draft PA prepared by the ANF and BLM describes the process for preventing adverse effects to cultural resources, treatment of human remains, and unanticipated discoveries.

Response U-3: The NOA for the Draft EIS/EIR was mailed to over 70 tribes, and organizations and numerous individuals on August 26, 2011. In addition, a CD of the Draft EIS/EIR and a summary of the Draft EIS/EIR were provided to the recipients of the NOA.

followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: Native American Contact List

Native American Contacts
Kern and Los Angeles Counties
September 29, 2011

Charles Cooke
32835 Santiago Road
Acton , CA 93510
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suscol@intox.net
Chumash
Fernandeno
Tataviam
Kitanemuk

LA City/County Native American Indian Comm
Ron Andrade, Director
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Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

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805 492-7255
(805) 558-1154 - cell
folkes9@msn.com
Chumash
Tataviam
Fernandeño

Ron Wermuth
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(916) 717-1176 - Cell
Tubatulabal
Kawaiisu
Koso
Yokuts

San Manuel Band of Mission Indians
James Ramos, Chairperson
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Highland , CA 92346
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(909) 864-3724 - FAX
(909) 864-3370 Fax
Serrano

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
981 N. Virginia
Covina , CA 91722
deedominguez@juno.com
(626) 339-6785
Yowlumne
Kitanemuk

Fernandeno Tataviam Band of Mission Indians
Ronnie Salas, Cultural Preservation Department
601 South Brand Boulevard, Suite 102
San Fernando CA 91340
rsalas@tataviam-nsn.gov
(818) 837-0794 Office
(818) 837-0796 Fax
Fernandeno
Tataviam

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
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tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax
Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2008041038; Joint NEPA/CEQA Document; draft Environmental Impact Statement (DEIS) and draft Environmental Impact Report (DEIR) for the Barren Ridge Renewable Transmission Project; located and stretching from the Tehachapi Mountains and Mojave desert area of Kern County

Native American Contacts
Kern and Los Angeles Counties
September 29, 2011

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
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San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 -FAX

Randy Guzman - Folkes
655 Los Angeles Avenue, Unit E — Chumash
Moorpark , CA 93021 — Fernandeño
ndnRandy@yahoo.com — Tataviam
(805) 905-1675 - cell — Shoshone Paiute
Yaqui

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
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Los Angeles , CA 90086
samdunlap@earthlink.net
(909) 262-9351 - cell

San Manuel Band of Mission Indians
Ann Brierty, Policy/Cultural Resources Departmen
26569 Community Center. Drive — Serrano
Highland , CA 92346
(909) 864-8933, Ext 3250
abrierty@sanmanuel-nsn.gov
(909) 862-5152 Fax

Kern Valley Indian Council
Robert Robinson, Co-Chairperson
P.O. Box 401 — Tubatulabal
Weldon , CA 93283 — Kawaiisu
brobinson@iwvisp.com — Koso
(760) 378-4575 (Home) — Yokuts
(760) 549-2131 (Work)

Gabrieleno Band of Mission Indians
Andrew Salas, Chairperson
P.O. Box 393 — Gabirelino Tongva
Covina , CA 91723
(626) 926-4131
gabrielenoindians@yahoo.com

This list is current only as of the date of this document.

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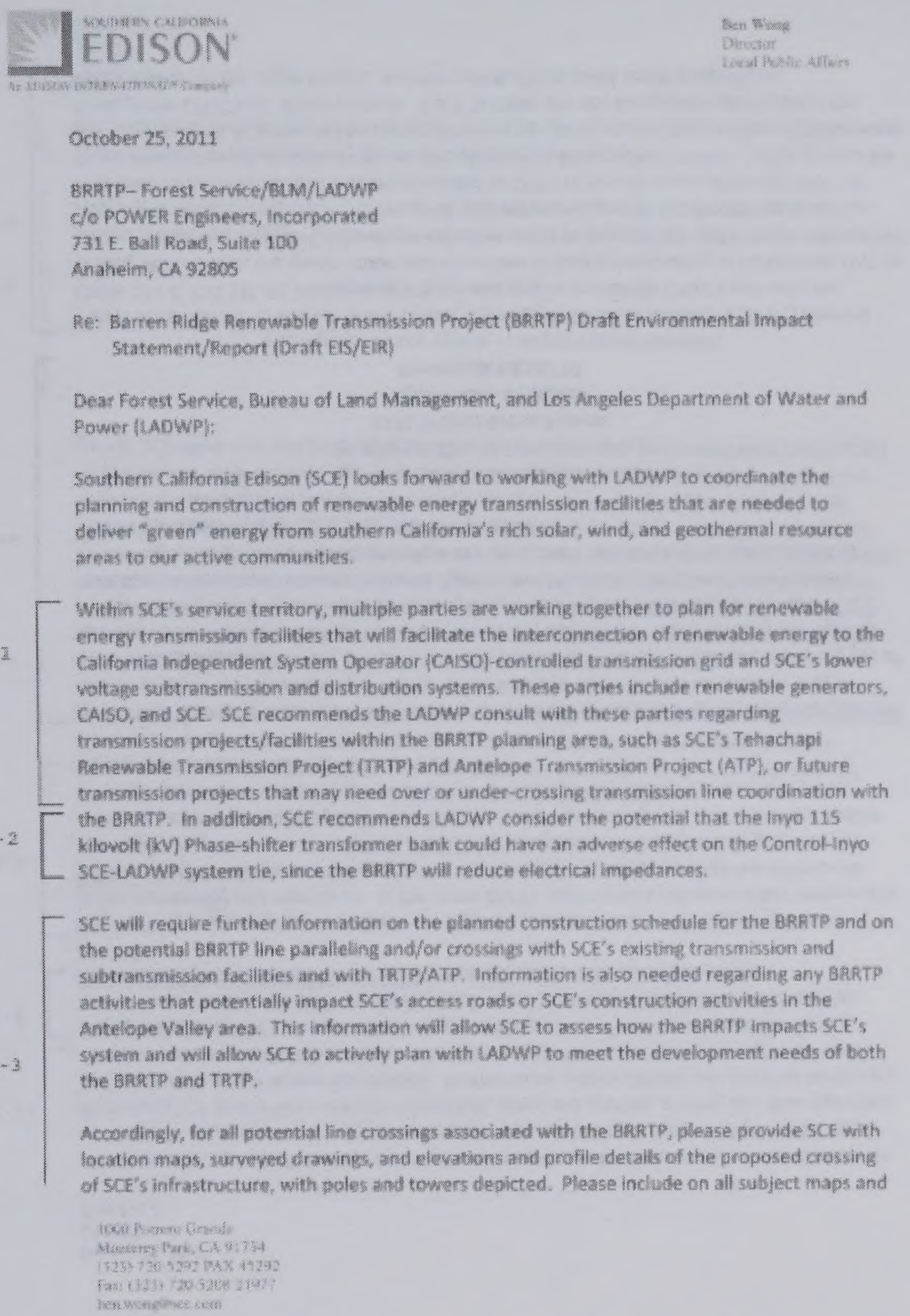
This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2006041038; Joint NEPA/CEQA Document; draft Environmental Impact Statement (DEIS) and draft Environmental Impact Report (DEIR) for the Barren Ridge Renewable Transmission Project; located and stretching from the Tehachapi Mountains and Mojave desert area of Kern County



SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

Ben Wong
Director
Local Public Affairs

October 25, 2011

BRRTP– Forest Service/BLM/LADWP
c/o POWER Engineers, Incorporated
731 E. Ball Road, Suite 100
Anaheim, CA 92805

Re: Barren Ridge Renewable Transmission Project (BRRTP) Draft Environmental Impact Statement/Report (Draft EIS/EIR)

Dear Forest Service, Bureau of Land Management, and Los Angeles Department of Water and Power (LADWP):

Southern California Edison (SCE) looks forward to working with LADWP to coordinate the planning and construction of renewable energy transmission facilities that are needed to deliver "green" energy from southern California's rich solar, wind, and geothermal resource areas to our active communities.

V-1 Within SCE's service territory, multiple parties are working together to plan for renewable
energy transmission facilities that will facilitate the interconnection of renewable energy to the
California Independent System Operator (CAISO)-controlled transmission grid and SCE's lower
voltage subtransmission and distribution systems. These parties include renewable generators,
CAISO, and SCE. SCE recommends the LADWP consult with these parties regarding
transmission projects/facilities within the BRRTP planning area, such as SCE's Tehachapi
Renewable Transmission Project (TRTP) and Antelope Transmission Project (ATP), or future
transmission projects that may need over or under-crossing transmission line coordination with
V-2 the BRRTP. In addition, SCE recommends LADWP consider the potential that the Inyo 115
kilovolt (kV) Phase-shifter transformer bank could have an adverse effect on the Control-Inyo
SCE-LADWP system tie, since the BRRTP will reduce electrical impedances.

V-3 SCE will require further information on the planned construction schedule for the BRRTP and on the potential BRRTP line paralleling and/or crossings with SCE's existing transmission and subtransmission facilities and with TRTP/ATP. Information is also needed regarding any BRRTP activities that potentially impact SCE's access roads or SCE's construction activities in the Antelope Valley area. This information will allow SCE to assess how the BRRTP impacts SCE's system and will allow SCE to actively plan with LADWP to meet the development needs of both the BRRTP and TRTP.

Accordingly, for all potential line crossings associated with the BRRTP, please provide SCE with location maps, surveyed drawings, and elevations and profile details of the proposed crossing of SCE's infrastructure, with poles and towers depicted. Please include on all subject maps and

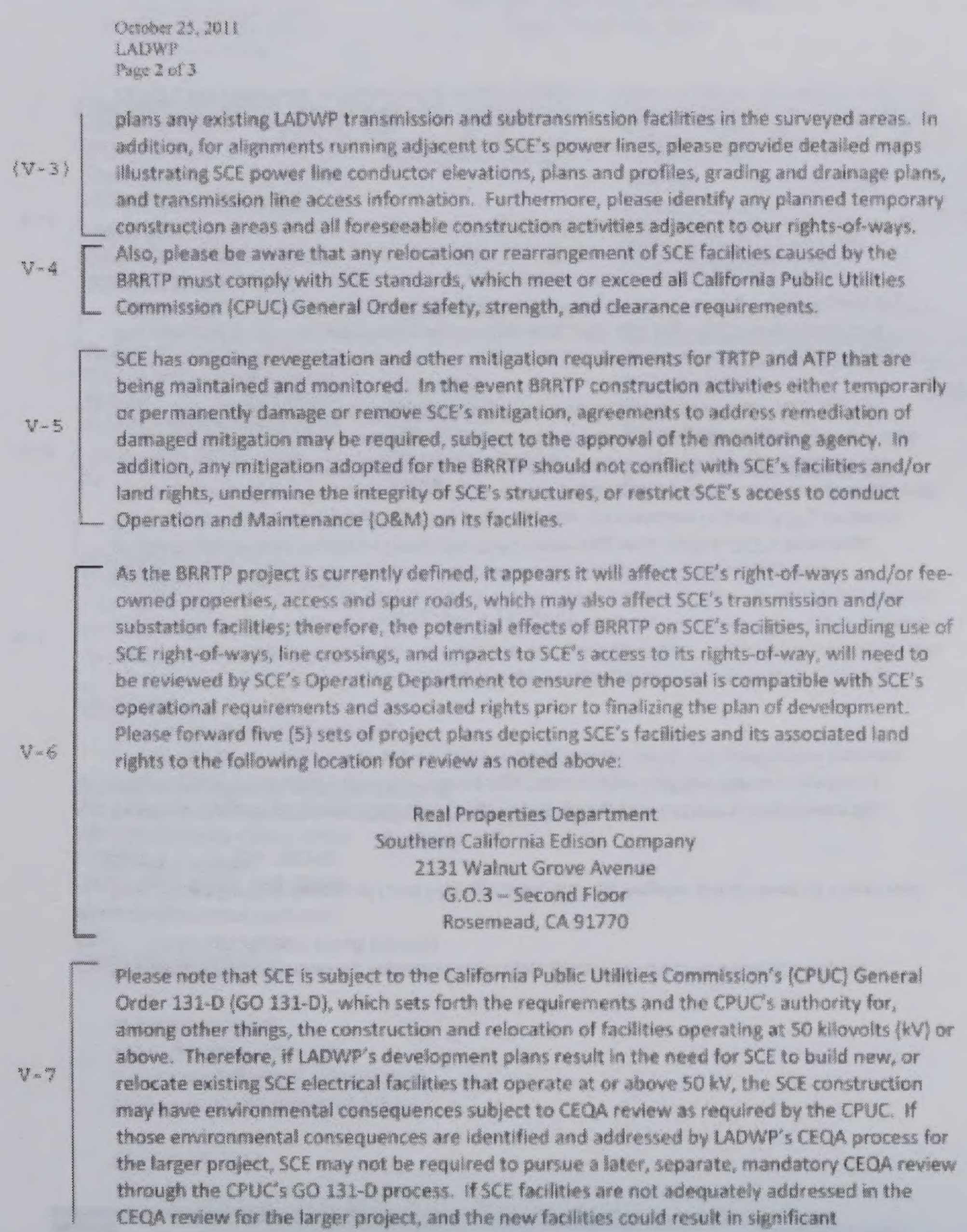
1000 Potrero Grande
Monterey Park, CA 91754
(323) 720-5292 PAX 45292
Fax: (323) 720-5208 21977
ben.wong@sce.com

LETTER V: SOUTHERN CALIFORNIA EDISON

Response V-1: LADWP Transmission Planning engineers have met with their Southern California Edison (SCE) counterparts on a number of occasions to disseminate and share the technical analysis regarding the BRRTP. If the Project is approved, LADWP would continue to consult with the appropriate agencies and projects within the BRRTP area.

Response V-2: Although it may appear that the post-BRRTP system would exacerbate the existing condition of unscheduled flow at the Control-Inyo SCE-LADWP system tie due to an even lower impedance path on the LADWP side, the BRRTP is planned with substantial renewable resource additions to the system; consequently, it would "push back" the unscheduled flow and relieve the potential phase-shifter overload conditions. Under the present condition, there is often some inadvertent (or unscheduled) flow going from the SCE side of the Control-Inyo tie to the LADWP side. This phenomenon occurs because LADWP's electrical circuit has the lower electrical impedance, or lesser resistance, path from the source to the load areas. To mitigate the unscheduled flow, the existing phase-shifter at the Control-Inyo tie was installed, thus reducing the dependency on LADWP's network to relieve potential congestion on the paralleling SCE 115 kV system.

In performing the technical analysis for the BRRTP, LADWP took into account the potential impact on its neighboring systems, including the Control-Inyo tie between SCE and LADWP. LADWP Transmission Planning engineers have met with their SCE counterparts on a number of occasions to disseminate and share the technical analysis regarding the BRRTP. LADWP engineers will continue to monitor the development of BRRTP and will inform the affected parties, including SCE and the California



October 25, 2011
LADWP
Page 2 of 3

(V-3) plans any existing LADWP transmission and subtransmission facilities in the surveyed areas. In addition, for alignments running adjacent to SCE's power lines, please provide detailed maps illustrating SCE power line conductor elevations, plans and profiles, grading and drainage plans, and transmission line access information. Furthermore, please identify any planned temporary construction areas and all foreseeable construction activities adjacent to our rights-of-ways.

V-4 Also, please be aware that any relocation or rearrangement of SCE facilities caused by the BRRTP must comply with SCE standards, which meet or exceed all California Public Utilities Commission (CPUC) General Order safety, strength, and clearance requirements.

V-5 SCE has ongoing revegetation and other mitigation requirements for TRTP and ATP that are being maintained and monitored. In the event BRRTP construction activities either temporarily or permanently damage or remove SCE's mitigation, agreements to address remediation of damaged mitigation may be required, subject to the approval of the monitoring agency. In addition, any mitigation adopted for the BRRTP should not conflict with SCE's facilities and/or land rights, undermine the integrity of SCE's structures, or restrict SCE's access to conduct Operation and Maintenance (O&M) on its facilities.

V-6 As the BRRTP project is currently defined, it appears it will affect SCE's right-of-ways and/or fee-owned properties, access and spur roads, which may also affect SCE's transmission and/or substation facilities; therefore, the potential effects of BRRTP on SCE's facilities, including use of SCE right-of-ways, line crossings, and impacts to SCE's access to its rights-of-way, will need to be reviewed by SCE's Operating Department to ensure the proposal is compatible with SCE's operational requirements and associated rights prior to finalizing the plan of development. Please forward five (5) sets of project plans depicting SCE's facilities and its associated land rights to the following location for review as noted above:

Real Properties Department
Southern California Edison Company
2131 Walnut Grove Avenue
G.O.3 – Second Floor
Rosemead, CA 91770

V-7 Please note that SCE is subject to the California Public Utilities Commission's (CPUC) General Order 131-D (GO 131-D), which sets forth the requirements and the CPUC's authority for, among other things, the construction and relocation of facilities operating at 50 kilovolts (kV) or above. Therefore, if LADWP's development plans result in the need for SCE to build new, or relocate existing SCE electrical facilities that operate at or above 50 kV, the SCE construction may have environmental consequences subject to CEQA review as required by the CPUC. If those environmental consequences are identified and addressed by LADWP's CEQA process for the larger project, SCE may not be required to pursue a later, separate, mandatory CEQA review through the CPUC's GO 131-D process. If SCE facilities are not adequately addressed in the CEQA review for the larger project, and the new facilities could result in significant

Independent System Operator (CAISO), if there is any detrimental impact to the phase shifter at the Control-Inyo tie. Potential alleviation opportunities would be considered, as necessary.

Response V-3: If the BRRTP is approved, the construction plan and schedule would be developed, including timing, location, staging, plans, profiles, grading and drainage plans, maps, and transmission line road access plans. LADWP would work with SCE and any other utilities or users in the area to share the information and ensure smooth coordination of adjacent uses.

Response V-4: LADWP is aware of SCE standards, and would coordinate with SCE as needed if the Project is approved.

Response V-5: LADWP will coordinate with SCE regarding adjacent projects if the Project is approved.

Response V-6: LADWP will coordinate with SCE regarding adjacent projects if the Project is approved. Applicable information would be transmitted to the contact you provided.

Response V-7: The agencies do not anticipate any impacts to SCE projects that would require additional CEQA analysis and documentation; however, LADWP would coordinate with SCE prior to the decision on the Project to elucidate those concerns.

(V-7) environmental impacts, the required additional CEQA review at the CPUC could delay approval of the SCE power line portion of the project for two years or longer.

V-8 In addition, please notify SCE directly of any subsequent NEPA/CEQA processes that are conducted for the BRRTP. Please send such notices to the following SCE operating department:

Southern California Edison Company
Local Public Affairs
Local Government Affairs – Land Use/Environmental
PO Box 800
Rosemead, CA 91770

Finally, SCE notes that the Draft EIS/EIR addresses the effects of electromagnetic fields (EMF) on the human environment. Although there are no NEPA or CEQA standards regarding the analysis of potential human risks associated with EMF exposure, the CPUC reviewed and updated its EMF policy in 2006 (CPUC Decision 06-01-042) for California's regulated electric utilities. This policy decision update reaffirmed the finding that state and federal public health regulatory agencies have not established a direct link between exposure to EMF and human health effects, and that the existing "no-cost and low-cost" precautionary-based EMF policy should be continued for electrical facilities. For further details, contact SCE's EMF Education Group at (800) 200-4723.

Once again, SCE appreciates the opportunity to comment on the BRRTP Draft EIS/EIR and looks forward to working cooperatively with LADWP so that together and as individual utility providers LADWP and SCE can meet the challenges of "greening" the grid. If you have any questions, please do not hesitate to contact me at (323) 720-5292.

Sincerely,

Ben Wong

Ben Wong
Director
Local Public Affairs, Los Angeles County

Response V-8: The address provided has been added to the BRRTP distribution list.

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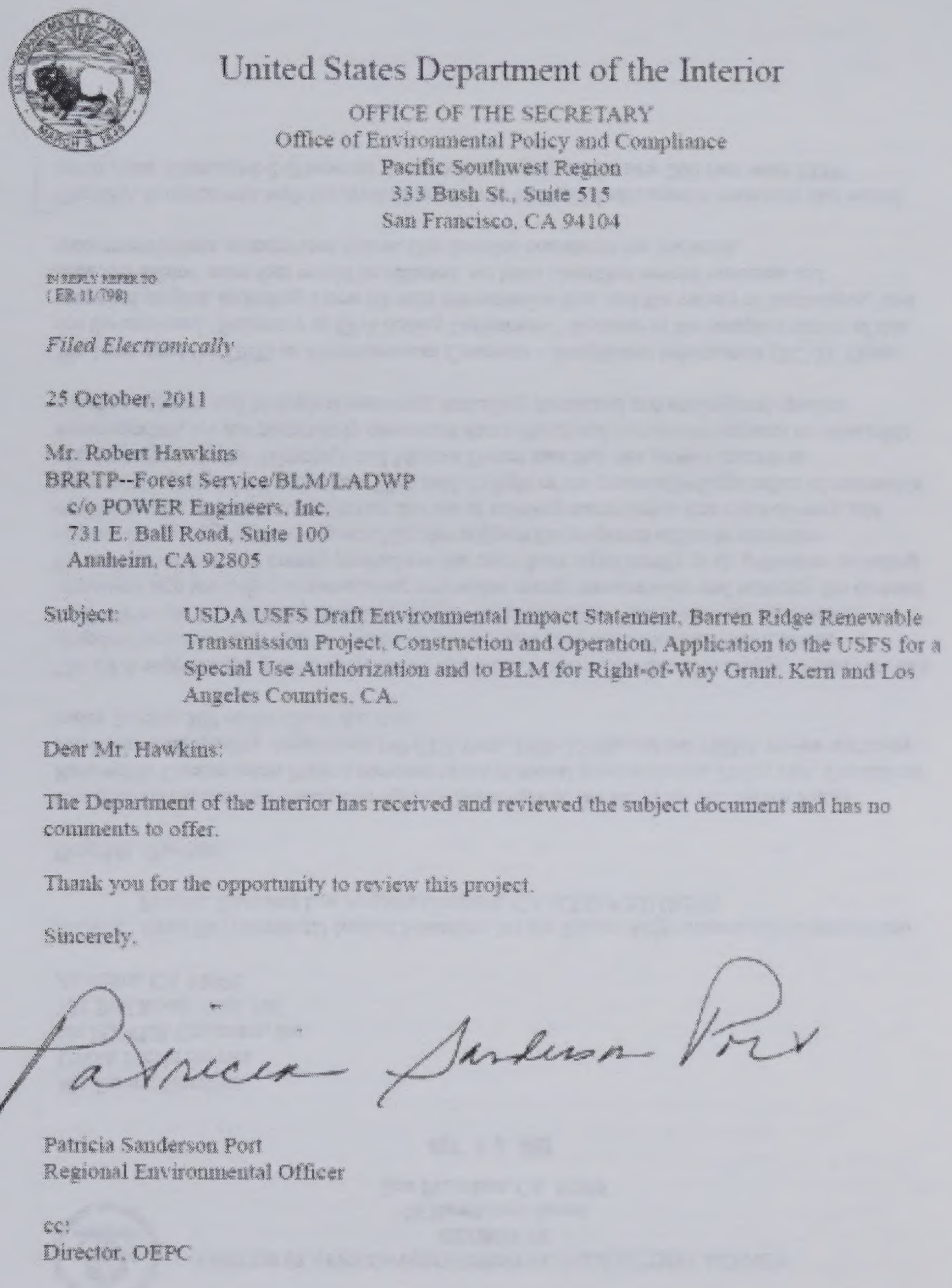


United States Department of the Interior
OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
333 Bush St., Suite 515
San Francisco, CA 94104

IN REPLY REFER TO:
(ER 11/798)

Filed Electronically

25 October, 2011

Mr. Robert Hawkins
BRRTP--Forest Service/BLM/LADWP
c/o POWER Engineers, Inc.
731 E. Ball Road, Suite 100
Anaheim, CA 92805

Subject: USDA USFS Draft Environmental Impact Statement, Barren Ridge Renewable Transmission Project, Construction and Operation, Application to the USFS for a Special Use Authorization and to BLM for Right-of-Way Grant, Kern and Los Angeles Counties, CA.

Dear Mr. Hawkins:

The Department of the Interior has received and reviewed the subject document and has no comments to offer.

Thank you for the opportunity to review this project.

Sincerely,

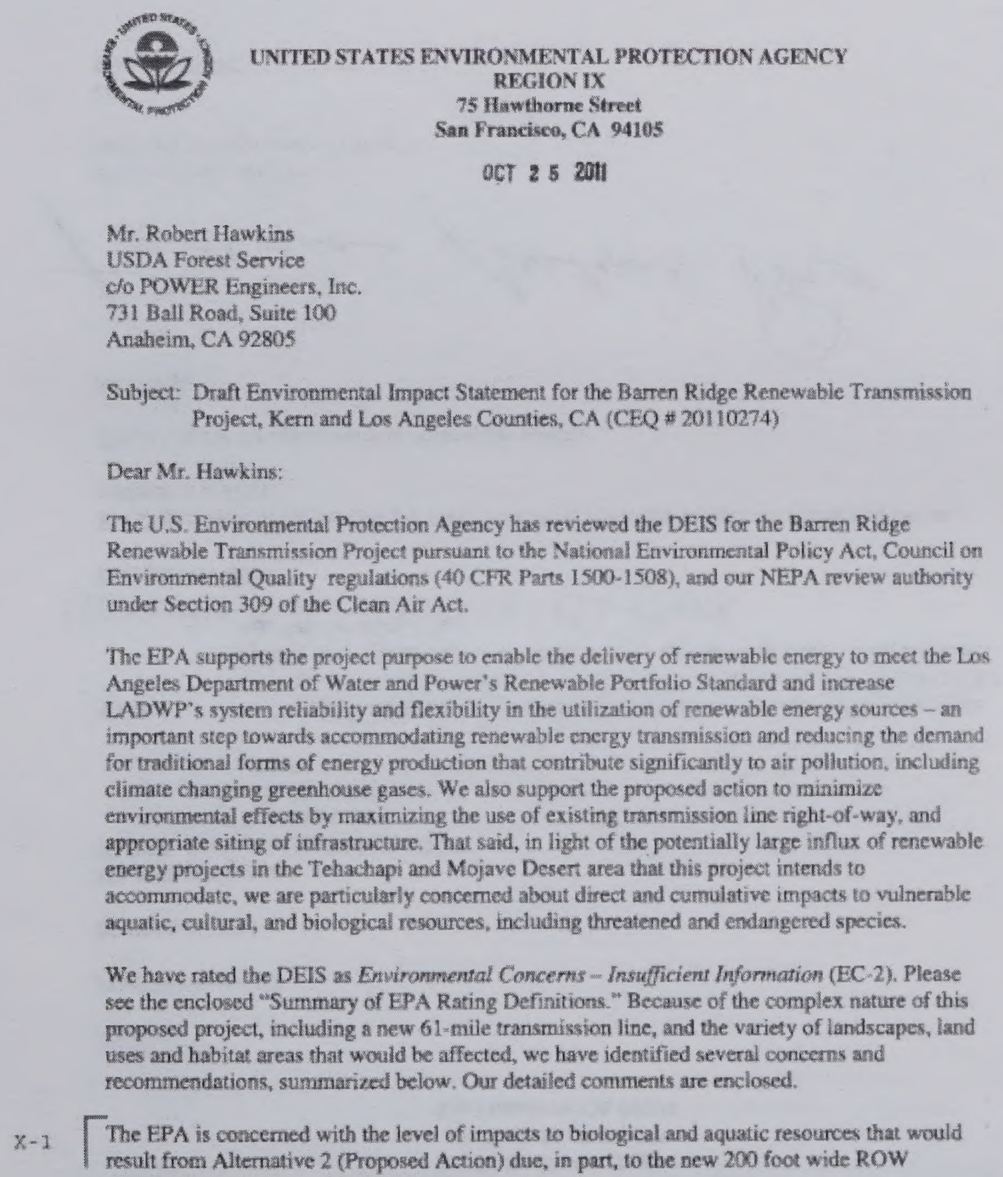
Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC

LETTER W: U.S. OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE

Response W-1: Thank you for your letter.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

OCT 25 2011

Mr. Robert Hawkins
USDA Forest Service
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

Subject: Draft Environmental Impact Statement for the Barren Ridge Renewable Transmission Project, Kern and Los Angeles Counties, CA (CEQ # 20110274)

Dear Mr. Hawkins:

The U.S. Environmental Protection Agency has reviewed the DEIS for the Barren Ridge Renewable Transmission Project pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

The EPA supports the project purpose to enable the delivery of renewable energy to meet the Los Angeles Department of Water and Power's Renewable Portfolio Standard and increase LADWP's system reliability and flexibility in the utilization of renewable energy sources – an important step towards accommodating renewable energy transmission and reducing the demand for traditional forms of energy production that contribute significantly to air pollution, including climate changing greenhouse gases. We also support the proposed action to minimize environmental effects by maximizing the use of existing transmission line right-of-way, and appropriate siting of infrastructure. That said, in light of the potentially large influx of renewable energy projects in the Tehachapi and Mojave Desert area that this project intends to accommodate, we are particularly concerned about direct and cumulative impacts to vulnerable aquatic, cultural, and biological resources, including threatened and endangered species.

We have rated the DEIS as *Environmental Concerns – Insufficient Information* (EC-2). Please see the enclosed "Summary of EPA Rating Definitions." Because of the complex nature of this proposed project, including a new 61-mile transmission line, and the variety of landscapes, land uses and habitat areas that would be affected, we have identified several concerns and recommendations, summarized below. Our detailed comments are enclosed.

X-1 The EPA is concerned with the level of impacts to biological and aquatic resources that would result from Alternative 2 (Proposed Action) due, in part, to the new 200 foot wide ROW

LETTER X: U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 9

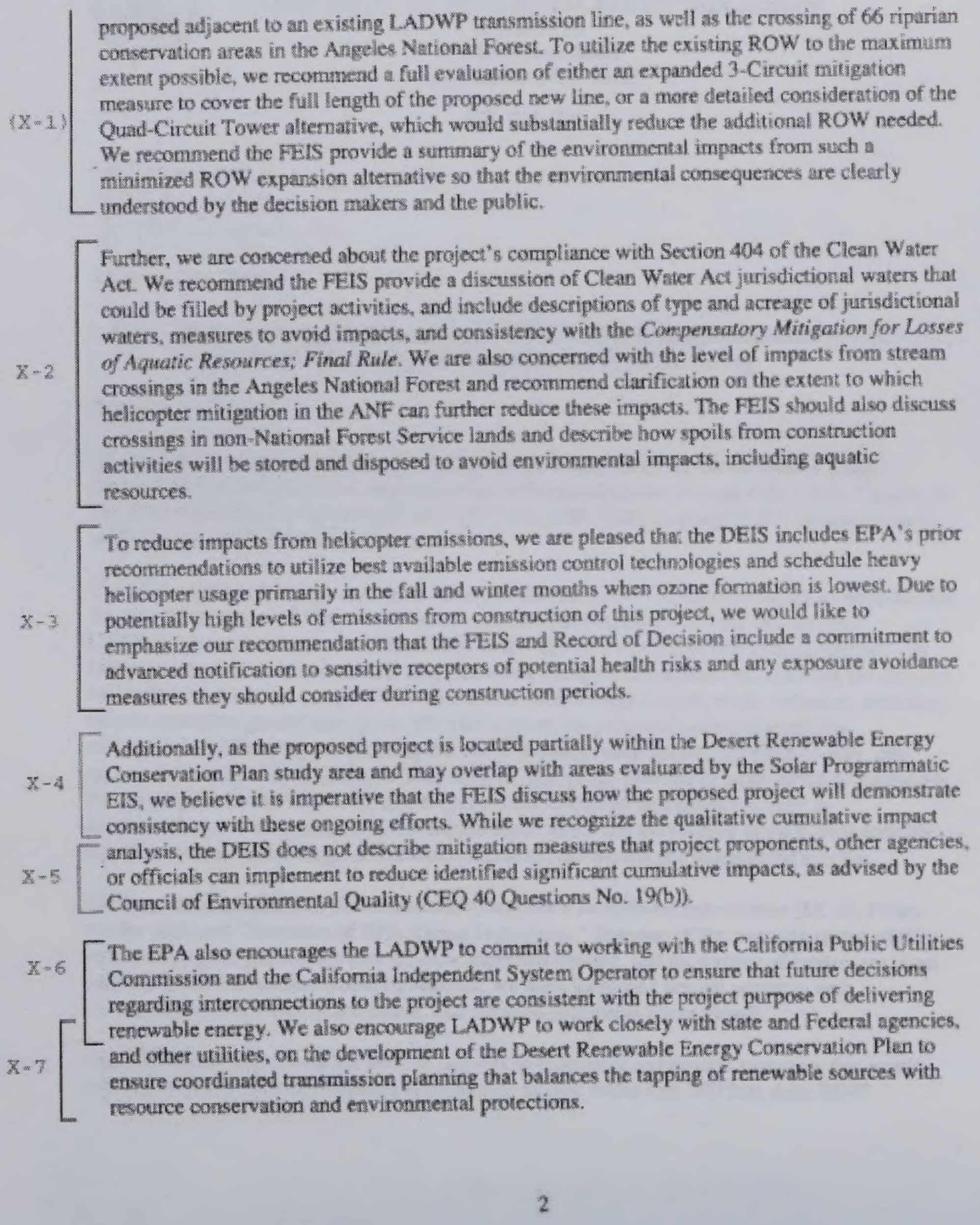
Response X-1: Impacts would be minimized with Alternative 2 due to the use of existing access roads for construction, operation, and maintenance. Existing stream crossings would be utilized, which would also avoid and mitigate potential impacts to water and aquatic resources. The descriptions of wetland and water resource crossings in the Draft EIS/EIR also clarify that avoidance by spanning these features would significantly reduce potential impacts, along with use of existing roads for crossings and other avoidance and mitigation measures. The transmission line design, if Alternative 2 is selected, would provide some flexibility in the placement of Project features, and avoidance such as described above would be accomplished for the selected alternative during simultaneous water resource surveys, Jurisdictional Determinations (JD), and transmission line detailed design (e.g., survey, structure spotting, detailed access design).

The quad-circuit structure was considered and eliminated from detailed consideration because it would not meet the purpose and need (see Table 2-2 of Chapter 2 of the Final EIS/EIR and pages 35 to 36 of the Alternatives Development Report, Appendix B to the Final EIS/EIR). We acknowledge that the quad circuit would align with BLM's and USFS's objectives to minimize utility corridor footprints on federally managed lands. It would also reduce the ROW required overall for the new line, but would result in unacceptable outages of all of the LADWP circuits in this corridor just to construct such a consolidated system utilizing the existing ROW. This corridor notably includes the Pacific DC Intertie, among the largest of all bulk transmission systems in the United States. Further, LADWP is interconnected into the Western Grid and follows Western Electricity Coordinating

Council (WECC) and North American Electric Reliability Corporation (NERC) standards for system reliability criteria. In the event of a structure loss, the placement of multiple circuits on single structures would reduce reliability by increasing the potential for the simultaneous loss of multiple circuits (entire bulk system in this corridor).

As pointed out, Alternative 2 would include a portion of the line where all three circuits are on a single structure to mitigate impacts to homes built adjacent to the existing transmission lines. This was incorporated into Alternative 2 by LADWP to minimize these residential impacts. While it would result in placing all of the AC lines in this corridor onto one set of structures through the Green Valley area, LADWP accepted the reliability risk in this short span to avoid the need to acquire private residences in the Green Valley and Elizabeth Lake communities. The existing high-capacity DC line in the corridor would not be affected by consolidating the three AC lines through the Green Valley area. The same types of impacts to residences would not occur on Alternative 2 either north or south of Green Valley, and, similar to the quad-circuit alternative, a three-circuit alternative for the entire Project would be considered a risk to reliability. Because of the reliability risks, WECC regulations would limit the transfer capacity of the three-circuit structures, therefore limiting the amount of renewable energy that would be transmitted in comparison to the Proposed Action. This would limit LADWP's GHG emission reduction, along with the ability to meet RPS goals and electrical demands.

A three-circuit alternative to cover the full length of the proposed new line would not meet the basic Project purpose and need/objectives. This alternative would also have limited transmission capacity to deliver renewable energy, and would therefore limit LADWP's ability to reduce GHG emissions, to meet RPS goals and electrical demands, and to allow



(X-1) proposed adjacent to an existing LADWP transmission line, as well as the crossing of 66 riparian conservation areas in the Angeles National Forest. To utilize the existing ROW to the maximum extent possible, we recommend a full evaluation of either an expanded 3-Circuit mitigation measure to cover the full length of the proposed new line, or a more detailed consideration of the Quad-Circuit Tower alternative, which would substantially reduce the additional ROW needed. We recommend the FEIS provide a summary of the environmental impacts from such a minimized ROW expansion alternative so that the environmental consequences are clearly understood by the decision makers and the public.

X-2 Further, we are concerned about the project's compliance with Section 404 of the Clean Water Act. We recommend the FEIS provide a discussion of Clean Water Act jurisdictional waters that could be filled by project activities, and include descriptions of type and acreage of jurisdictional waters, measures to avoid impacts, and consistency with the *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule*. We are also concerned with the level of impacts from stream crossings in the Angeles National Forest and recommend clarification on the extent to which helicopter mitigation in the ANF can further reduce these impacts. The FEIS should also discuss crossings in non-National Forest Service lands and describe how spoils from construction activities will be stored and disposed to avoid environmental impacts, including aquatic resources.

X-3 To reduce impacts from helicopter emissions, we are pleased that the DEIS includes EPA's prior recommendations to utilize best available emission control technologies and schedule heavy helicopter usage primarily in the fall and winter months when ozone formation is lowest. Due to potentially high levels of emissions from construction of this project, we would like to emphasize our recommendation that the FEIS and Record of Decision include a commitment to advanced notification to sensitive receptors of potential health risks and any exposure avoidance measures they should consider during construction periods.

X-4 Additionally, as the proposed project is located partially within the Desert Renewable Energy Conservation Plan study area and may overlap with areas evaluated by the Solar Programmatic EIS, we believe it is imperative that the FEIS discuss how the proposed project will demonstrate consistency with these ongoing efforts. While we recognize the qualitative cumulative impact
X-5 analysis, the DEIS does not describe mitigation measures that project proponents, other agencies, or officials can implement to reduce identified significant cumulative impacts, as advised by the Council of Environmental Quality (CEQ 40 Questions No. 19(b)).

X-6 The EPA also encourages the LADWP to commit to working with the California Public Utilities Commission and the California Independent System Operator to ensure that future decisions regarding interconnections to the project are consistent with the project purpose of delivering
X-7 renewable energy. We also encourage LADWP to work closely with state and Federal agencies, and other utilities, on the development of the Desert Renewable Energy Conservation Plan to ensure coordinated transmission planning that balances the tapping of renewable sources with resource conservation and environmental protections.

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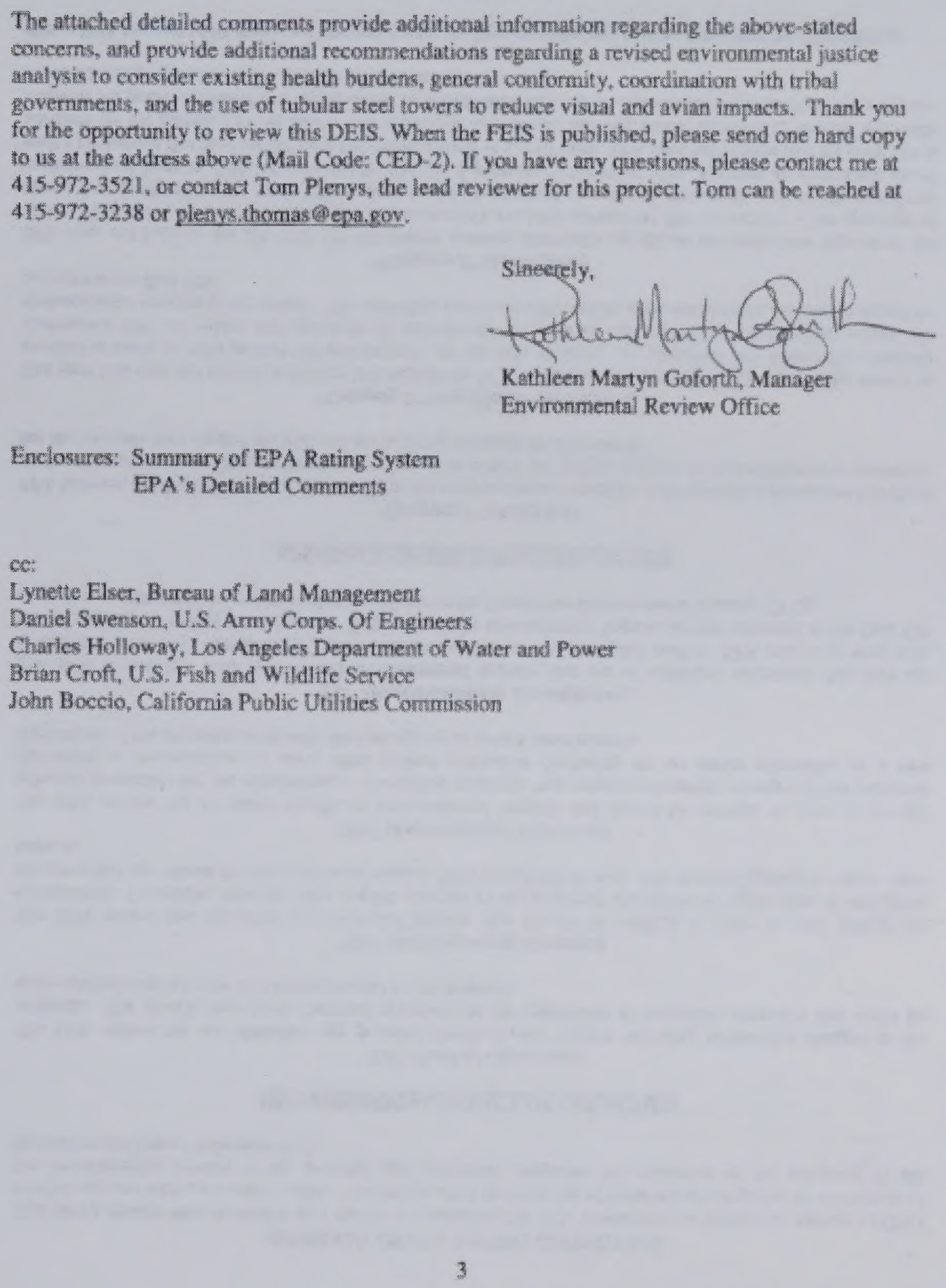
interconnection and expansion of renewable energy resources. It would also create greater temporary impacts during construction due to the need for a temporary line during construction and removal of the existing Barren Ridge-Rinaldi transmission line. Please refer to page 2-31 of the Final EIS/EIR for new documentation of this alternative being considered and eliminated from detailed analysis.

Because a three-circuit alternative would not meet the Project's basic purpose and need/objectives, it was eliminated from further consideration in the Final EIS/EIR (see page 2-31) and a detailed analysis of impacts is not required.

Response X-2: The Water Resources analysis provided in the Final EIS/EIR in Section 4.3.3 is sufficient to make a decision of an environmentally preferred and lowest impact alternative (and Least Environmentally Damaging Practicable Alternative under CWA Section 404(b)(1) Guidelines). The lead agencies' issuance of authorizations for construction activities would be conditioned upon Project permitting with the appropriate agencies, pursuant to the CWA. A JD would be conducted during Project permitting and after a specific route has been selected. Because final design is necessary for the JD, it is not practical to perform a JD on all alternatives to understand the potential impacts and determine a preferred alternative for water resources. The alternatives were evaluated using a number of primary and secondary data sources, including inventory and assessment of surface water resources mapping by:

- GIS using the National Hydrography Dataset (NHD)
- geospatial wetlands digital data from the National Wetlands Index
- high-resolution aerial photography



The attached detailed comments provide additional information regarding the above-stated concerns, and provide additional recommendations regarding a revised environmental justice analysis to consider existing health burdens, general conformity, coordination with tribal governments, and the use of tubular steel towers to reduce visual and avian impacts. Thank you for the opportunity to review this DEIS. When the FEIS is published, please send one hard copy to us at the address above (Mail Code: CED-2). If you have any questions, please contact me at 415-972-3521, or contact Tom Plenys, the lead reviewer for this project. Tom can be reached at 415-972-3238 or plenys.thomas@epa.gov.

Sincerely,

Kathleen Martyn Goforth, Manager
Environmental Review Office

Enclosures: Summary of EPA Rating System
EPA's Detailed Comments

cc:
Lynette Elser, Bureau of Land Management
Daniel Swenson, U.S. Army Corps. Of Engineers
Charles Holloway, Los Angeles Department of Water and Power
Brian Croft, U.S. Fish and Wildlife Service
John Boccio, California Public Utilities Commission

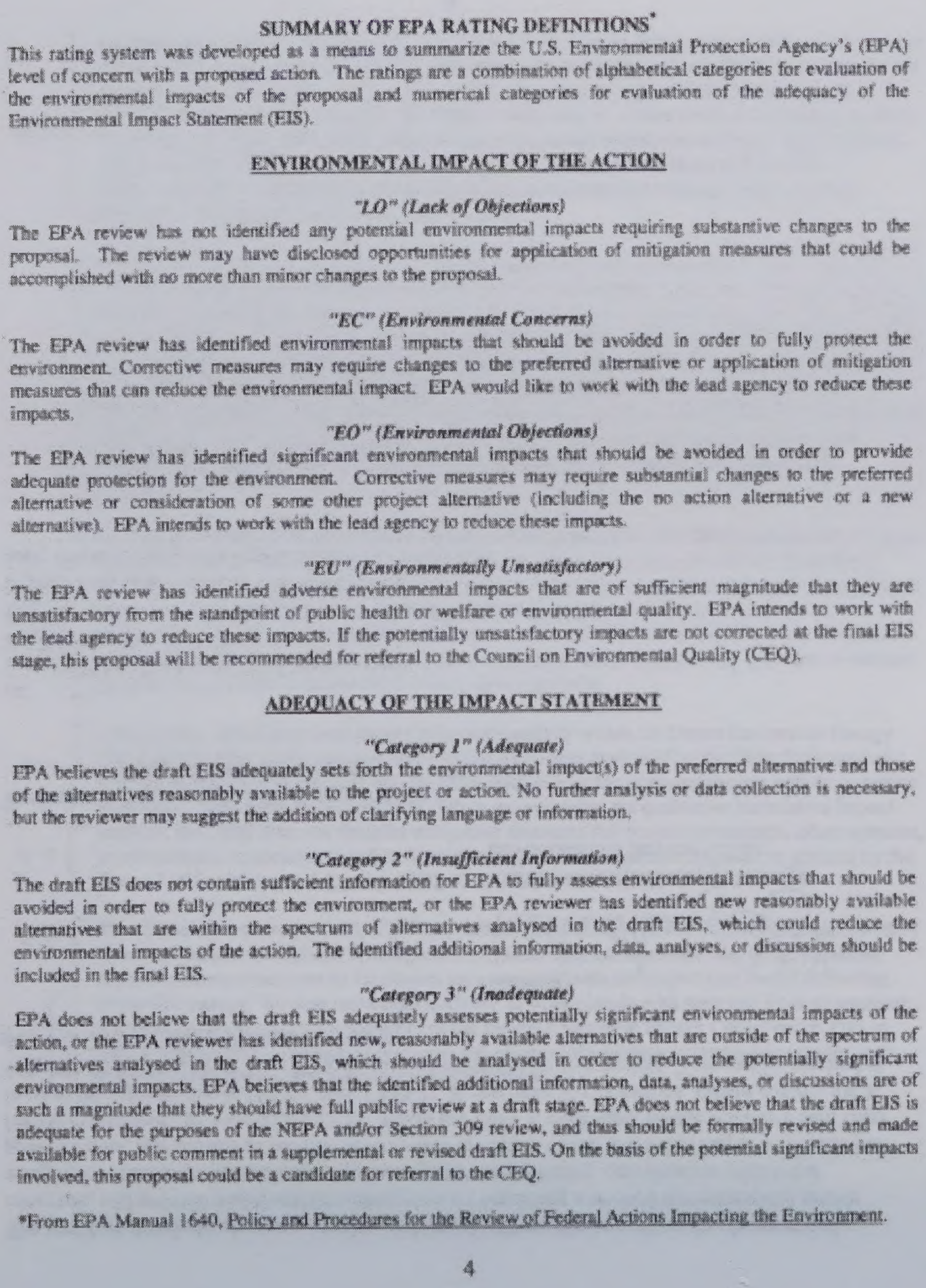
3

- USGS topographic maps to assess the location and type of water resources within the Project area

While the NHD and NWI do not typically contain information on ephemeral streams, they were also located and mapped using aerial photography combined with field evaluation. In fact, detailed resource inventory was included in the analysis for flooding, erosion, sedimentation, wetlands, steams, and other water resources in the Draft EIS/EIR.

If one of the alternatives is approved through the environmental process, a JD would be conducted that would include all surface waters within the Project ROW, including ephemeral drainages. This delineation would also include other potential Waters of the State (California) and Waters of the U.S. The ordinary high water mark is only one of the parameters that would be considered when delineating surface waters; following selection of the approved Project route and during the permitting process, we would consult with the Regional Water Quality Control Boards, as well as the USACE, prior to conducting the JD to ensure that their concerns are addressed. The field inventories and analysis would be described and quantified in the report that would be included in the Preconstruction Notification Package submitted to the USACE. The report would include types and acreage of affected waters, measures to avoid impacts (if different than the measures already included as part of the EIS/EIR), and a compensatory mitigation plan, if required due to Project activities.

For additional information on water crossings on non-USFS lands and how spoils would be stored and disposed of, along with a complete explanation of water resource impacts, please see the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. Refer to Section 2.4.4, Helicopter Mitigation, in Chapter 2 of the Final EIS/EIR for a full description of the



SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

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*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

potential use of helicopter construction to eliminate the need for new access roads to structure locations and associated minimization of ground disturbance impacts. No specific locations requiring Helicopter Mitigation have been identified for the Proposed Action; however, Helicopter Mitigation will be required if final design identifies locations within the Angeles National Forest where terrain is steep and access is limited.

Response X-3: General Practice GP-59, found in Table 2-8 in Chapter 2 of the Final EIS/EIR, has been modified to specify advance notice to residents for air quality and noise impacts specifically. As described in Chapter 4, Section 4.2.1 of the Final EIS/EIR, the risk to sensitive receptors from construction-related toxic air contaminants, including helicopter use, was found to be less than significant for all Alternatives due to the lack of sensitive receptors, their distance from each construction site, implementation of mitigation measure AIR-3, and the temporary nature of construction at each location.

Response X-4: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. The Desert Renewable Energy Conservation Plan (DRECP) was under development at the time of the publication of the Final EIS/EIR. It was not feasible to delay environmental review for the BRRTP until the completion of the DRECP because of LADWP's Renewable Portfolio Standard, which requires that 35% of LADWP's energy be renewable by 2020 (see Section 1.2.2 of Chapter 1 of the Final EIS/EIR). Please refer to Appendix D, Regulatory Setting, of the Final EIS/EIR for new information on the DRECP. A discussion of BLM's Solar Programmatic Environmental Impact Statement (PEIS) has also been added to Appendix D of the Final EIS/EIR. The Solar PEIS would not be applicable to BRRTP because it is a transmission project rather than a solar project.

Response X-5: Chapter 5 of the Final EIS/EIR has been revised to include a summary of potential mitigation that could be implemented by other parties to reduce cumulative impacts in Section 5.2.5.

Response X-6: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP, and LADWP would coordinate with appropriate agencies to be consistent with delivery of renewable energy.

LADWP continues to work with State agencies such as the California Public Utility Commission (CPUC), California Energy Commission (CEC), and California Independent System Operator (CAISO) on all aspects of long-term transmission planning. LADWP actively participated in the Renewable Energy Transmission Initiative (RETI) studies from 2005 to 2010.

LADWP is been working with the California Transmission Planning Group (CTPG) since its inception in 2008. CTPG members include CAISO, publicly owned utilities (e.g., LADWP, SMUD, IID), investor-owned utilities (e.g., SCE, PG&E, SDG&E) and other organizations and agencies (e.g., SCPPA, WAPA).

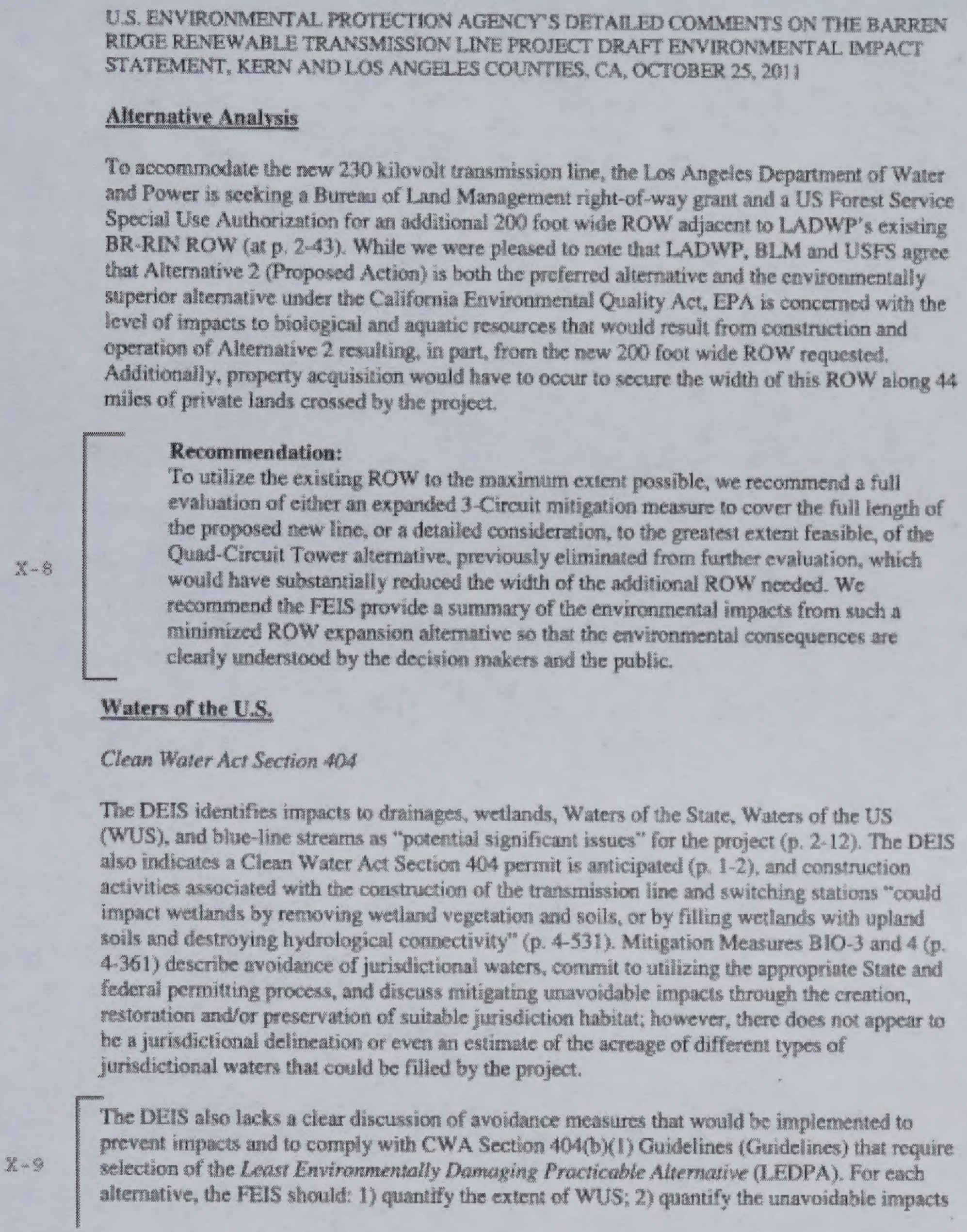
The CTPG is a forum for conducting joint transmission planning studies consistent with Federal Energy Regulatory Commission (FERC) Order 890 principles, and the RETI, which is a state-wide initiative to help identify the transmission projects needed to accommodate renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting.

The purpose of the CTPG Study is to develop a state-wide transmission plan that identifies the transmission infrastructure needed to deliver renewable energy reliably and efficiently meet, by year 2020, the State's 33% Renewable Portfolio Standard (RPS) goal and to provide planning information useful to project sponsors (inside or outside of CTPG), decision-makers, and regulatory entities (i.e., CPUC, CEC, FERC) in order to reach decisions on which elements of the conceptual transmission plan should be pursued.

The BRRTP is one of the high-priority transmission needs identified in the 2010 CTPG State Wide Transmission Plan. Further, LADWP is also participating in the Desert Renewable Energy Conservation Plan.

Additional information on LADWP's interconnection process has been added to the Final EIS/EIR in Chapter 1, Section 1.2.4, and in Chapter 2, Section 2.4.7. As described there, LADWP's process for approving generator interconnection to BRRTP would follow the FERC's approved Large Generator Interconnection Procedures (LGIP). Per FERC requirements, LADWP is required to treat all Interconnection Customers (IC) equally. While all current ICs of the BRRTP are either wind or solar projects, LADWP does not have the ability to preferentially treat renewable energy ICs over other non-renewable generators should they request interconnection. LADWP processes interconnection requests in the order received until all applications have been processed or facility capacity has been reached. If one project withdraws, the next queued request would be processed.

Response X-7: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP, and LADWP would coordinate



U.S. ENVIRONMENTAL PROTECTION AGENCY'S DETAILED COMMENTS ON THE BARREN RIDGE RENEWABLE TRANSMISSION LINE PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT, KERN AND LOS ANGELES COUNTIES, CA, OCTOBER 25, 2011

Alternative Analysis

To accommodate the new 230 kilovolt transmission line, the Los Angeles Department of Water and Power is seeking a Bureau of Land Management right-of-way grant and a US Forest Service Special Use Authorization for an additional 200 foot wide ROW adjacent to LADWP's existing BR-RIN ROW (at p. 2-43). While we were pleased to note that LADWP, BLM and USFS agree that Alternative 2 (Proposed Action) is both the preferred alternative and the environmentally superior alternative under the California Environmental Quality Act, EPA is concerned with the level of impacts to biological and aquatic resources that would result from construction and operation of Alternative 2 resulting, in part, from the new 200 foot wide ROW requested. Additionally, property acquisition would have to occur to secure the width of this ROW along 44 miles of private lands crossed by the project.

X-8 **Recommendation:**
To utilize the existing ROW to the maximum extent possible, we recommend a full evaluation of either an expanded 3-Circuit mitigation measure to cover the full length of the proposed new line, or a detailed consideration, to the greatest extent feasible, of the Quad-Circuit Tower alternative, previously eliminated from further evaluation, which would have substantially reduced the width of the additional ROW needed. We recommend the FEIS provide a summary of the environmental impacts from such a minimized ROW expansion alternative so that the environmental consequences are clearly understood by the decision makers and the public.

Waters of the U.S.

Clean Water Act Section 404

The DEIS identifies impacts to drainages, wetlands, Waters of the State, Waters of the US (WUS), and blue-line streams as "potential significant issues" for the project (p. 2-12). The DEIS also indicates a Clean Water Act Section 404 permit is anticipated (p. 1-2), and construction activities associated with the construction of the transmission line and switching stations "could impact wetlands by removing wetland vegetation and soils, or by filling wetlands with upland soils and destroying hydrological connectivity" (p. 4-531). Mitigation Measures BIO-3 and 4 (p. 4-361) describe avoidance of jurisdictional waters, commit to utilizing the appropriate State and federal permitting process, and discuss mitigating unavoidable impacts through the creation, restoration and/or preservation of suitable jurisdiction habitat; however, there does not appear to be a jurisdictional delineation or even an estimate of the acreage of different types of jurisdictional waters that could be filled by the project.

X-9 The DEIS also lacks a clear discussion of avoidance measures that would be implemented to prevent impacts and to comply with CWA Section 404(b)(1) Guidelines (Guidelines) that require selection of the *Least Environmentally Damaging Practicable Alternative* (LEDPA). For each alternative, the FEIS should: 1) quantify the extent of WUS; 2) quantify the unavoidable impacts

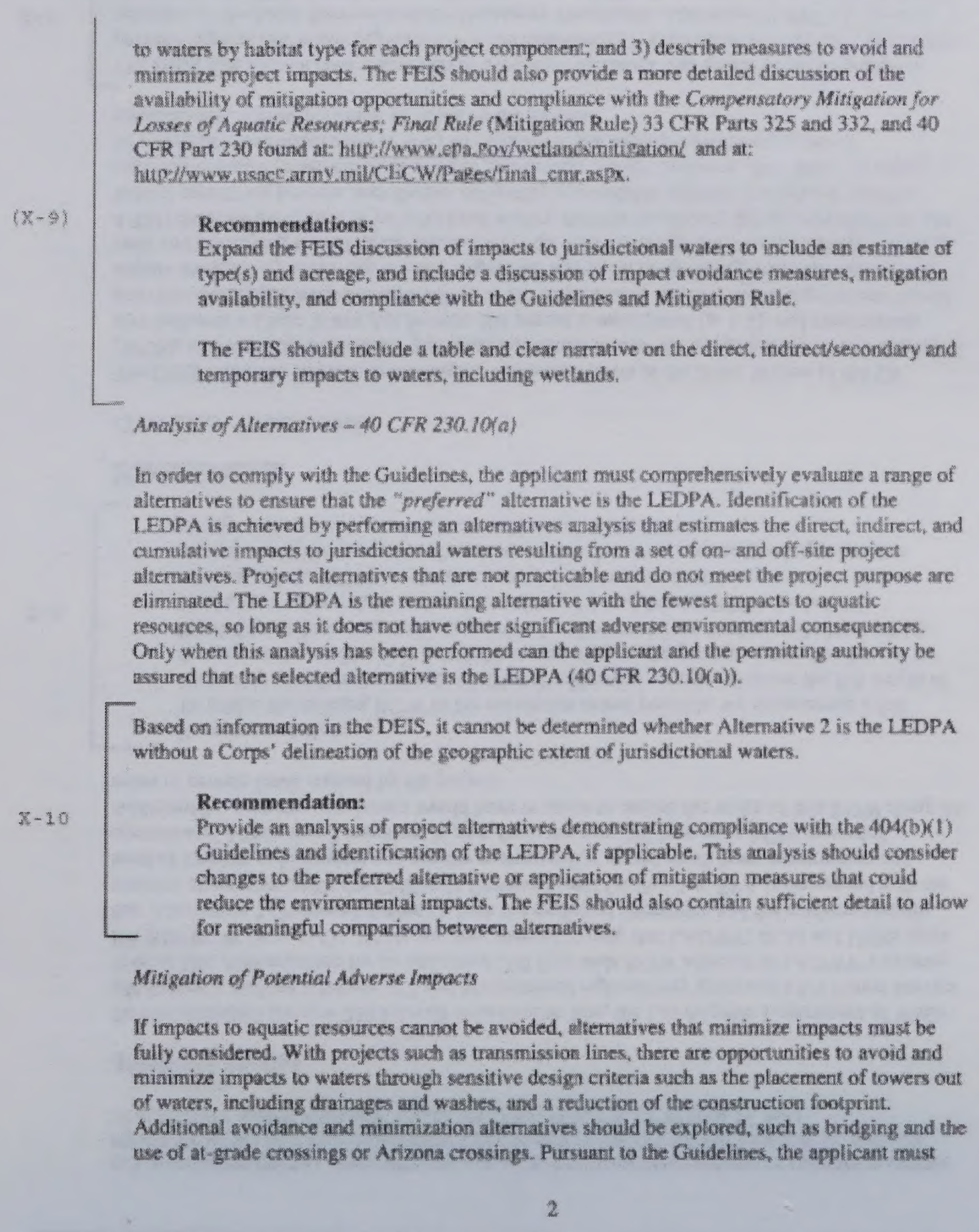
with appropriate agencies and utilities to be consistent with delivery of renewable energy. Please refer to Response X-6 above.

Response X-8: Please refer to Response X-1 above.

Response X-9: Impacts to waters would be minimized through the use of existing access roads for construction, operation, and maintenance for nearly all of the action alternatives. Existing stream crossings would be utilized, which would also avoid and mitigate potential impacts to water and aquatic resources. The discussion of wetland and water resource crossings in Sections 3.3.3 and 4.3.3 of the Final EIS/EIR also describes that avoidance by spanning these features would significantly reduce potential impacts. Mitigation measures to further reduce impacts to water are described in Section 4.3.3 of the Final EIS/EIR.

The transmission line design, if one of the action alternatives is selected, would be quite flexible, and avoidance such as described above would be accomplished for the selected alternative during simultaneous water resource surveys, JDs, and transmission line detailed design (e.g., survey, structure spotting, detailed access design).

A JD has not yet been done, but would be conducted if one of the action alternatives is selected by the agencies. The lead agencies would not issue authorizations to begin construction until completion of all permitting requirements, including those of the individual or Nationwide Clean Water Act 404 Permit, of which the JD would be a part. Final transmission line design would be required prior to completion of the JD. At that time, we would be able to quantify the extent of Waters of the U.S., as well as any unavoidable impacts to Waters by habitat type for each Project component and any additional mitigation measures. Pending the JD, please refer to Section 4.3.3 of the Final EIS/EIR and Section



to waters by habitat type for each project component; and 3) describe measures to avoid and minimize project impacts. The FEIS should also provide a more detailed discussion of the availability of mitigation opportunities and compliance with the *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (Mitigation Rule) 33 CFR Parts 325 and 332, and 40 CFR Part 230 found at: http://www.epa.gov/wetlands/mitigation/ and at: http://www.usace.army.mil/CECW/Pages/final_cmr.aspx.

(X-9)

Recommendations:
Expand the FEIS discussion of impacts to jurisdictional waters to include an estimate of type(s) and acreage, and include a discussion of impact avoidance measures, mitigation availability, and compliance with the Guidelines and Mitigation Rule.

The FEIS should include a table and clear narrative on the direct, indirect/secondary and temporary impacts to waters, including wetlands.

Analysis of Alternatives – 40 CFR 230.10(a)

In order to comply with the Guidelines, the applicant must comprehensively evaluate a range of alternatives to ensure that the *"preferred"* alternative is the LEDPA. Identification of the LEDPA is achieved by performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences. Only when this analysis has been performed can the applicant and the permitting authority be assured that the selected alternative is the LEDPA (40 CFR 230.10(a)).

Based on information in the DEIS, it cannot be determined whether Alternative 2 is the LEDPA without a Corps' delineation of the geographic extent of jurisdictional waters.

X-10

Recommendation:
Provide an analysis of project alternatives demonstrating compliance with the 404(b)(1) Guidelines and identification of the LEDPA, if applicable. This analysis should consider changes to the preferred alternative or application of mitigation measures that could reduce the environmental impacts. The FEIS should also contain sufficient detail to allow for meaningful comparison between alternatives.

Mitigation of Potential Adverse Impacts

If impacts to aquatic resources cannot be avoided, alternatives that minimize impacts must be fully considered. With projects such as transmission lines, there are opportunities to avoid and minimize impacts to waters through sensitive design criteria such as the placement of towers out of waters, including drainages and washes, and a reduction of the construction footprint. Additional avoidance and minimization alternatives should be explored, such as bridging and the use of at-grade crossings or Arizona crossings. Pursuant to the Guidelines, the applicant must

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5.6 of the Water Resources Technical Report in Volume IV for information on potential Waters of the U.S. and wetlands.

Also refer to Response X-2 (above) regarding determining the Least Environmentally Damaging Practicable Alternative under CWA Section 404(b)(1) Guidelines. In fact, the Final EIS/EIR does quantify the extent of Waters of the U.S., the unavoidable impacts to Waters, and the means and effectiveness of the avoidance and mitigation measures in Section 4.3.3 of the Final EIS/ EIR.

For a discussion of direct, indirect/secondary, and temporary impacts to Waters of the U.S., including wetlands, please see Section 6.5.1 and Section 7 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR, for a discussion of impact analysis results. General Practice GP-53 specifies the incorporation of riparian area avoidance and permit measures and General Practice GP-54 specifies the avoidance of impacting streambeds and banks (refer to Table 2-8 in Chapter 2 of the Final EIS/EIR). Additionally, the mitigation measures included in Table 4.3.3-1 in Chapter 4 of the Final EIS/EIR would ensure that impacts and alterations to riparian areas would be minimized. HYD-1 and HYD-2 address the construction, operation, and closing of access roads and routes to minimize impacts to water resources. HYD-3 requires that new impervious areas associated with temporary construction be restored to existing conditions after construction. HYD-4 would ensure that drainage within switching station walls would be designed to minimize erosion and increase sediment control.

Response X-10: This analysis in the Final EIS/EIR is sufficient and adequate to make a decision of an environmentally preferred and lowest impact alternative (including the LEDPA under CWA Section 404(b)(1) Guidelines). A JD would be conducted during mitigate for unavoidable impacts to WUS. EPA offers the following recommendations to help facilitate compliance of the project with the Section 404 Guidelines:

X-11

Recommendations:
Include a mitigation plan for unavoidable impacts to WUS, as required by Corps and EPA regulations, and describe how the proposed project would meet 404 (b)(1) Guidelines, which require that projects first avoid, then minimize, and, finally, mitigate any impacts to WUS, including wetlands and other special aquatic sites.

Characterize the functions of any aquatic features that could be affected by the project that are determined not to constitute WUS, and discuss potential mitigation.

Pursuant to the Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to jurisdictional waters after the LEDPA has been determined. For this reason, it would be premature to examine in detail any mitigation proposal before compliance with 40 CFR 230.10(a) is established.

X-12

Recommendations:
Include an outline of the requirements of a compensatory mitigation plan, and a commitment to timely implementation of a wetland/riparian mitigation plan to ensure no temporal loss of the affected habitat, as applicable.

Describe contingency measures that would be implemented should the initial plan fail to meet specified goals, and specify who will be responsible for implementing the contingency measures.

Ephemeral Washes and Other Water Resources

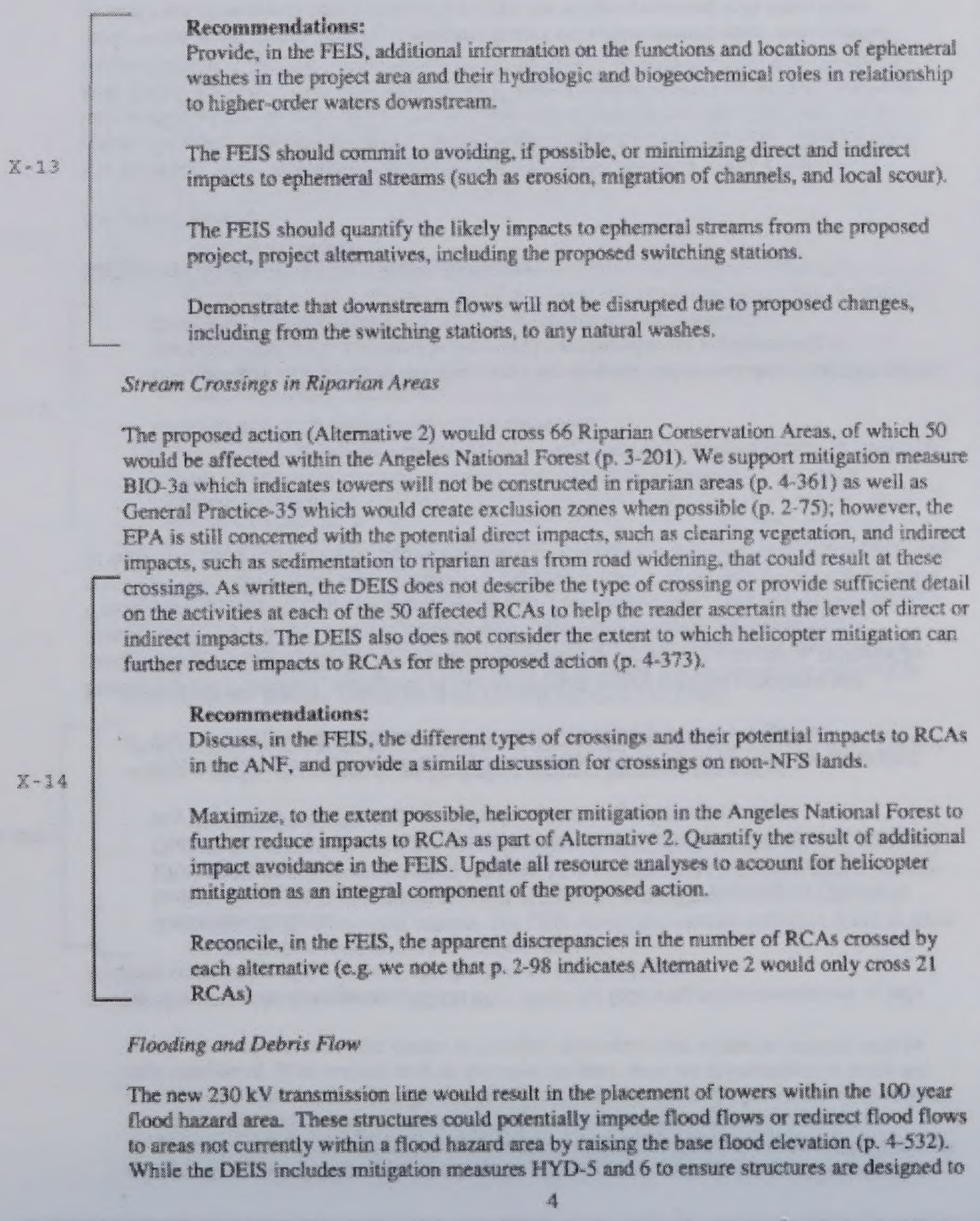
Ephemeral Washes

The FEIS should include additional detailed information on the functions and locations of ephemeral washes. In addition to Pine Tree Canyon and Cache Creek, we note that multiple unnamed ephemeral and intermittent drainages would be crossed between mile marker 0 and mile marker 13.2 (p. 3-194). Natural ephemeral washes perform a diversity of hydrologic and biogeochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. Potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems: adequate capacity for flood control, energy dissipation, and sediment movement, as well as impacts to valuable habitat for desert species.

Project permitting when a specific alternative has been selected. It is not practical to perform a JD on all alternatives to understand the potential impacts and determine a preferred alternative for water resources. Also refer to Responses X-2 and X-9 above for further information about how and when a JD would be completed if one of the action alternatives is approved through the environmental process. Further, for an analysis of each Project alternative and a sharp comparison of the alternatives, please see Sections 7 and 8.3 of the Water Resources Technical Report, located in Volume IV of the Final EIS/EIR and Chapter 4, Section 4.3.3 on pages 4-561 through 4-571 in the Final EIS/EIR. The Proposed Action would result in the fewest impacts to water resources because the transmission line for this Alternative would be shortest, have fewer stream crossings, and cross fewer miles of steep slopes.

Response X-11: Mitigation measures addressing impacts to water resources are presented in Section 4.3.3 of the Final EIS/EIR. Consistent with regulations, a detailed mitigation plan would be developed for any unavoidable impacts to Waters of the U.S. As described above, a JD would be conducted during permitting after the final Project route is selected. Pending a JD, specific mitigation plans for impacts to Waters of the U.S., if any, and compensatory plans would be premature. When the JD has been conducted and impacts, if any, are known, any additional mitigation measures, including a potential required compensatory mitigation plan, would be provided as part of the federal and State of California permitting processes and the Construction, Operation, and Maintenance Plan. Please also refer to Responses X-2 and X-9 above.

Response X-12: If an action alternative is approved, the federal agencies would prepare a Habitat Restoration and Revegetation Plan for National Forest System (NFS) lands and public lands managed by the BLM, which would include plans for restoration,



X-13

Recommendations:
Provide, in the FEIS, additional information on the functions and locations of ephemeral washes in the project area and their hydrologic and biogeochemical roles in relationship to higher-order waters downstream.

The FEIS should commit to avoiding, if possible, or minimizing direct and indirect impacts to ephemeral streams (such as erosion, migration of channels, and local scour).

The FEIS should quantify the likely impacts to ephemeral streams from the proposed project, project alternatives, including the proposed switching stations.

Demonstrate that downstream flows will not be disrupted due to proposed changes, including from the switching stations, to any natural washes.

Stream Crossings in Riparian Areas

The proposed action (Alternative 2) would cross 66 Riparian Conservation Areas, of which 50 would be affected within the Angeles National Forest (p. 3-201). We support mitigation measure BIO-3a which indicates towers will not be constructed in riparian areas (p. 4-361) as well as General Practice-35 which would create exclusion zones when possible (p. 2-75); however, the EPA is still concerned with the potential direct impacts, such as clearing vegetation, and indirect impacts, such as sedimentation to riparian areas from road widening, that could result at these crossings. As written, the DEIS does not describe the type of crossing or provide sufficient detail on the activities at each of the 50 affected RCAs to help the reader ascertain the level of direct or indirect impacts. The DEIS also does not consider the extent to which helicopter mitigation can further reduce impacts to RCAs for the proposed action (p. 4-373).

X-14

Recommendations:
Discuss, in the FEIS, the different types of crossings and their potential impacts to RCAs in the ANF, and provide a similar discussion for crossings on non-NFS lands.

Maximize, to the extent possible, helicopter mitigation in the Angeles National Forest to further reduce impacts to RCAs as part of Alternative 2. Quantify the result of additional impact avoidance in the FEIS. Update all resource analyses to account for helicopter mitigation as an integral component of the proposed action.

Reconcile, in the FEIS, the apparent discrepancies in the number of RCAs crossed by each alternative (e.g. we note that p. 2-98 indicates Alternative 2 would only cross 21 RCAs)

Flooding and Debris Flow

The new 230 kV transmission line would result in the placement of towers within the 100 year flood hazard area. These structures could potentially impede flood flows or redirect flood flows to areas not currently within a flood hazard area by raising the base flood elevation (p. 4-532). While the DEIS includes mitigation measures HYD-5 and 6 to ensure structures are designed to

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enhancement/re-vegetation, and/or mitigation banking. LADWP would prepare the Habitat Restoration and Revegetation Plan for non-federal lands.

Both plans would include: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for top soil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting would occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bareroot or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program; (j) locations and impacts to all oaks and native trees (over three inches diameters at breast height); and (k) locations of temporary or permanent gates, barricades, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (item k on NFS and BLM lands only). Contingency measures would be outlined in the Habitat Restoration and Revegetation Plan in the form of meeting success criteria.

Response X-13: As explained in Responses H-3, X-2, and X-9, a JD would be conducted during Project permitting if a specific action alternative is selected. It is not practical to perform a JD on all alternatives to understand the potential impacts and determine a preferred alternative for water resources. The alternatives were evaluated using a number of primary and secondary data sources, including inventory and assessment of surface water resources mapping by:

- GIS using the NHD
- geospatial wetlands digital data from the NWI
- high-resolution aerial photography

- USGS topographic maps to assess the location and type of water resources within the Project area

While the NHD and NWI do not typically contain information on ephemeral streams, they were located and mapped using aerial photography combined with field evaluation. This level of information was included in the impact assessment for water resources in the Draft and Final EIS/EIR. Discussion in the Draft and Final EIS/EIR about potential impacts related to flooding, erosion, sedimentation, etc. include ephemeral streams.

Although ephemeral drainages were not specifically called out in the Water Resources Technical Report or the EIS/EIR, due to their quantity, they were included in the impacts analysis, and all General Practices and mitigation measures that would apply to other streams would also apply to ephemeral streams.

If one of the action alternatives is approved through the environmental process, a JD would be conducted during Project permitting that would include all surface waters within the Project ROW, including ephemeral drainages. This delineation would include ephemeral drainages and other potential Waters of the State (California) and Waters of the U.S. The ordinary high water mark is only one of the parameters that would be considered when delineating surface waters; following selection of the approved Project route, we would consult with the RWQCBs, as well as the USACE, prior to conducting the JD to ensure that their concerns are addressed. Also please refer to the Water Resources Technical Report located in Volume IV of the Final EIS/EIR for a complete explanation of water resource impacts, including those to ephemeral streams.

For information on how General Practices and mitigation measures would protect streams from potential impacts, please see Sections

6.5 and 6.5.1 of the Water Resources Technical Report located in Volume IV of the Final EIS/EIR. Refer to Response X-9.

Response X-14: The RCA surveys identified stream crossings with the potential to be impacted by construction. We do not specify the type of crossing or associated activities that would occur, as this information would be developed during the design phase. The design phase would be initiated only after the approval of the Final EIS/EIR. However, to account for not having specific design information for each crossing, we assumed and analyzed both direct and indirect impacts to each crossing. In addition to avoidance measures outlined in BIO-3, a USFS RCA Treatment Plan would be developed. The RCA Treatment Plan will include the specific activities that would occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan will include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal, or tree trimming), monitoring requirements, and restoration requirements. The implementation of the RCA plan would account for potential direct impacts, such as clearing vegetation, and indirect impacts, such as sedimentation to riparian areas from road widening. In addition, GP-5 would require the implementation of a SWPPP, and this would also address potential indirect impacts from sedimentation to riparian areas from road widening.

See Section 2.4.4 of the Final EIS/ EIR for a full description of the helicopter mitigation, which was included in the EIS/EIR as an integral component of the Proposed Action and Alternatives as appropriate to reduce impacts to various resources, including biological resources. As such, helicopter mitigation was not impede or redirect direct flood flows and minimize the capture of flood debris, no additional details are provided.

X-15 **Recommendation:**
The FEIS should identify areas subject to flash floods where structures are likely to be placed, discuss the impacts of the project on flood flows and demonstrate how flows will not be impeded and flood debris will obstruct flows or result in scouring.

Construction spoil disposal

Project construction includes auguring for transmission tower foundations and the creation of concrete batch plants. The EPA is concerned that these activities could generate significant amounts of sediment runoff into aquatic resources. According to the DEIS, 25 to 120 cubic yards of concrete would be needed for each tower foundation, depending on the design (p. 2-58). These volumes would presumably replace similar volumes of excavated and/or augured spoils. Concrete batch plants are estimated to be approximately 2 acres each in size. The DEIS indicates spoil material would be spread around the tower site and used for fill where suitable (p. 2-58). Spoils generated from these activities could result in substantial volumes of loose sediment potentially contributing to water quality degradation and habitat impacts, as well as air quality impacts from fugitive dust. The FEIS should describe in detail what would be done with construction spoils and commit to storage and disposal methods that would avoid and minimize impacts.

X-16 **Recommendation:**
Describe in detail how the construction spoils will be used and how environmental impacts would be avoided.

Air Quality

Mitigation Measures

The proposed project is located in the South Coast and Mojave Desert Air Basins which are both in non-attainment for eight hour ozone (p. 3-4). The South Coast is also in non-attainment for particulate matter smaller than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$). Of significant concern are potential air quality impacts in the Santa Clarita region which is in extreme federal and State non-attainment for ozone. The DEIS states that daily construction emissions are expected to exceed the Air Quality Management Districts' regional planning thresholds for nitrogen oxide (NOx) and reactive organic gases (ROGs), which contribute to ozone formation, as well as $PM_{2.5}$, PM_{10} and carbon monoxide (p.4-19).

EPA supports incorporating mitigation strategies to minimize fugitive dust emissions, as well as emission controls for PM and ozone precursors for construction-related activity. We note the numerous General Practices proposed by LADWP (p. 2-72) and commend USFS and BLM for the additional mitigation measures presented in Table 4.2.1-3. We were also pleased that, to reduce helicopter emissions, BLM and USFS have adopted EPA's prior recommendations to

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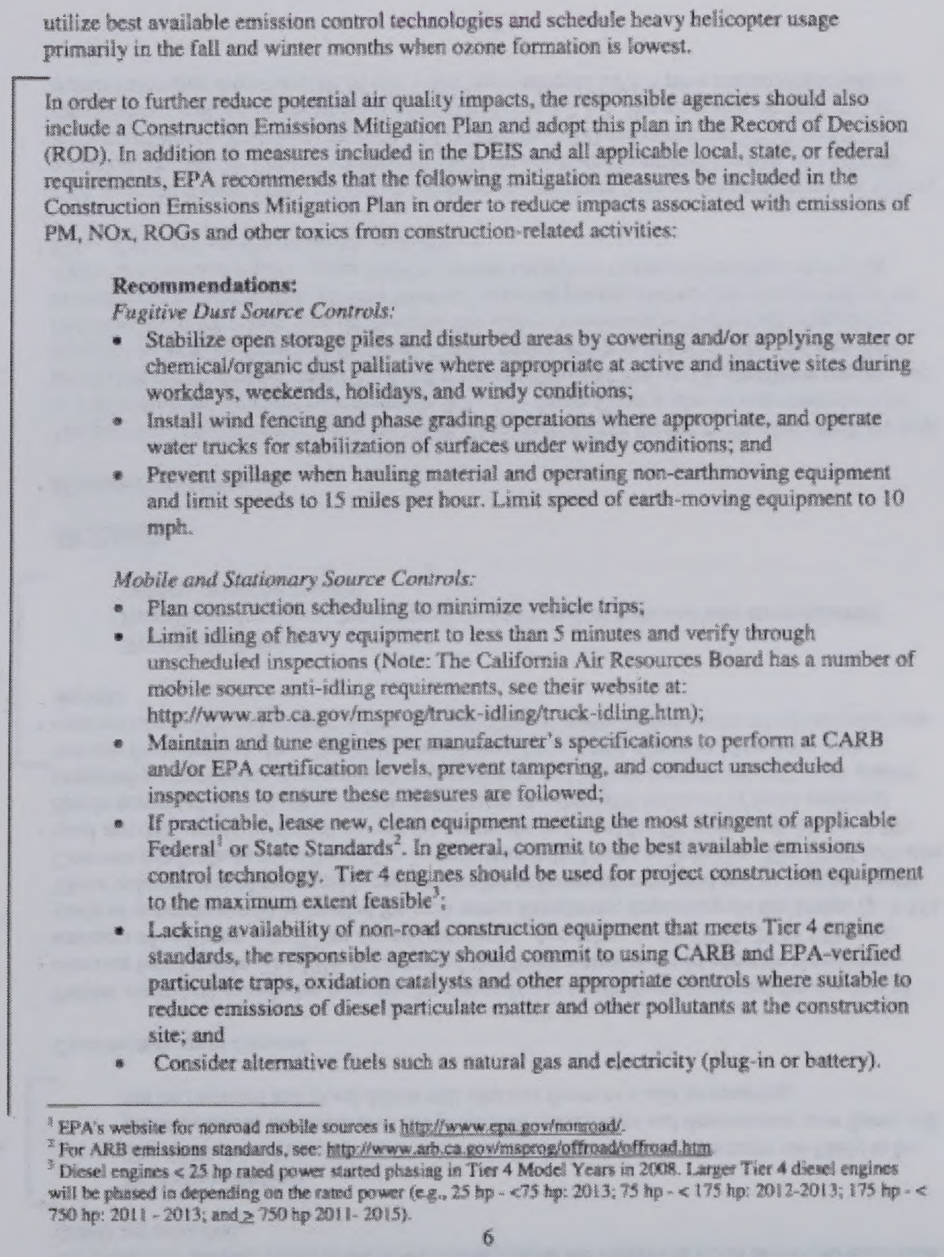
considered and analyzed in the environmental impact and cumulative effects analyses found in Section 5.3 of the Final EIS/EIR, and updates to the resource analyses are not necessary. A review of the number of RCAs identified for each Alternative was conducted, and discrepancies in the number of RCAs crossed have been reconciled in Section 2.6 and Table 2-11 of Chapter 2 of the Final EIS/EIR.

Response X-15: The Draft EIS/EIR analysis consisted of available data from existing databases. To determine areas prone to flooding, we accessed FEMA flood hazard zone information, which does not delineate flood hazard zones below the 100-year reoccurrence level. Areas prone to flash flooding, such as ephemeral washes, would be identified in the JD if one of the action alternatives is approved. Once identified, any structures at risk of being placed in a hazard zone would be relocated outside the hazard zone as allowed by Project design and engineering requirements, to avoid impacts to both the washes and to Project components.

Response X-16: The Project would prepare and implement a Soil Management Plan, as stated in GP-7 of the Water Resource Technical Report, located in Appendix IV of the Final EIS/EIR, to provide guidance for the proper handling and disposal of impacted soils, and would include practices that are consistent with California Occupational Safety and Health Administration (Cal-OSHA) regulations. In addition, GP-38 would require that soil excavated from construction activities not be left at work areas where slopes are greater than 10 percent or that are located within 100 feet of a "receiving water." In these situations, loose soil would be stockpiled elsewhere or stored at a staging area prior to disposal (as specified in the Soil Management Plan). Stockpiles would be managed according to Best Management Practices (BMPs) specific in the Project SWPPP. Furthermore, no



utilize best available emission control technologies and schedule heavy helicopter usage primarily in the fall and winter months when ozone formation is lowest.

X-17

In order to further reduce potential air quality impacts, the responsible agencies should also include a Construction Emissions Mitigation Plan and adopt this plan in the Record of Decision (ROD). In addition to measures included in the DEIS and all applicable local, state, or federal requirements, EPA recommends that the following mitigation measures be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of PM, NOx, ROGs and other toxics from construction-related activities:

Recommendations:
Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions;
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
- Prevent spillage when hauling material and operating non-earthmoving equipment and limit speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Plan construction scheduling to minimize vehicle trips;
- Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections (Note: The California Air Resources Board has a number of mobile source anti-idling requirements, see their website at: http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm);
- Maintain and tune engines per manufacturer's specifications to perform at CARB and/or EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed;
- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal[1] or State Standards[2]. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible[3];
- Lacking availability of non-road construction equipment that meets Tier 4 engine standards, the responsible agency should commit to using CARB and EPA-verified particulate traps, oxidation catalysts and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site; and
- Consider alternative fuels such as natural gas and electricity (plug-in or battery).

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[1] EPA's website for nonroad mobile sources is http://www.epa.gov/nonroad/.
[2] For ARB emissions standards, see: http://www.arb.ca.gov/msprog/offroad/offroad.htm.
[3] Diesel engines < 25 hp rated power started phasing in Tier 4 Model Years in 2008. Larger Tier 4 diesel engines will be phased in depending on the rated power (e.g., 25 hp - <75 hp: 2013; 75 hp - < 175 hp: 2012-2013; 175 hp - < 750 hp: 2011 - 2013; and ≥ 750 hp 2011- 2015).

stockpiling or spreading of loose soils would be allowed within stream channels.

GP-46 would prohibit asphalt or cement equipment from being rinsed in any stream or waterway. In addition, asphalt or concrete effluent would not be allowed to enter any "receiving water." The SWPPP would also include BMPs to prevent batch plants from impacting receiving waters through stormwater flow.

Response X-17: Several of the measures proposed by the Environmental Protection Agency (EPA) to be included in the mitigation measures for construction are already accounted for in mitigation measures AIR-2a, AIR-2b, AIR-2d, AIR-2e, and AIR-2g. However, after a review of EPA's recommendations, we have incorporated some revisions in the mitigation descriptions in the Final EIS/EIR on pages 4-10 through 4-13.

Administrative controls:

(X-17)

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;
- Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and
- Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which you will minimize impacts to these populations (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes).

Public Health and Sensitive Receptor Notification

In light of the projected daily emission exceedances, the FEIS should include a detailed discussion of the potential health effects of these emissions to sensitive receptors and consider a mitigation measure that would inform sensitive receptors of these potential risks in advance of construction. This information should be provided concurrently with advanced notification of construction for noise impacts.

X-18

Recommendations:
Expand the air quality impact analysis to include a detailed discussion of the potential effects to sensitive receptors from exposure to PM_{10} and $PM_{2.5}$, as well as toxic air contaminants.

Consider a mitigation measure that would provide advanced notification to sensitive receptors of the potential effects of PM_{10} and $PM_{2.5}$, as well as toxic air contaminants.

General Conformity

The FEIS should ensure that the direct and indirect emissions from both the construction and the operational phases of the project conform to the approved State Implementation Plan and do not cause or contribute to violations of the NAAQS. The DEIS notes: "In addition to the regional and localized significance thresholds, the General Conformity Rule applicability emissions thresholds (also referred to as *de minimis* thresholds) are shown in Table 4.2.1-2 and would apply to those portions of the BRRTP that require Federal approval and would be in Federal nonattainment areas" (p. 4-9). The DEIS does not clearly state how the estimate of direct and indirect emissions attributed to the proposed action for general conformity purposes is consistent with the definition of "direct emissions" and "indirect emissions" in 40 CFR 93.152.

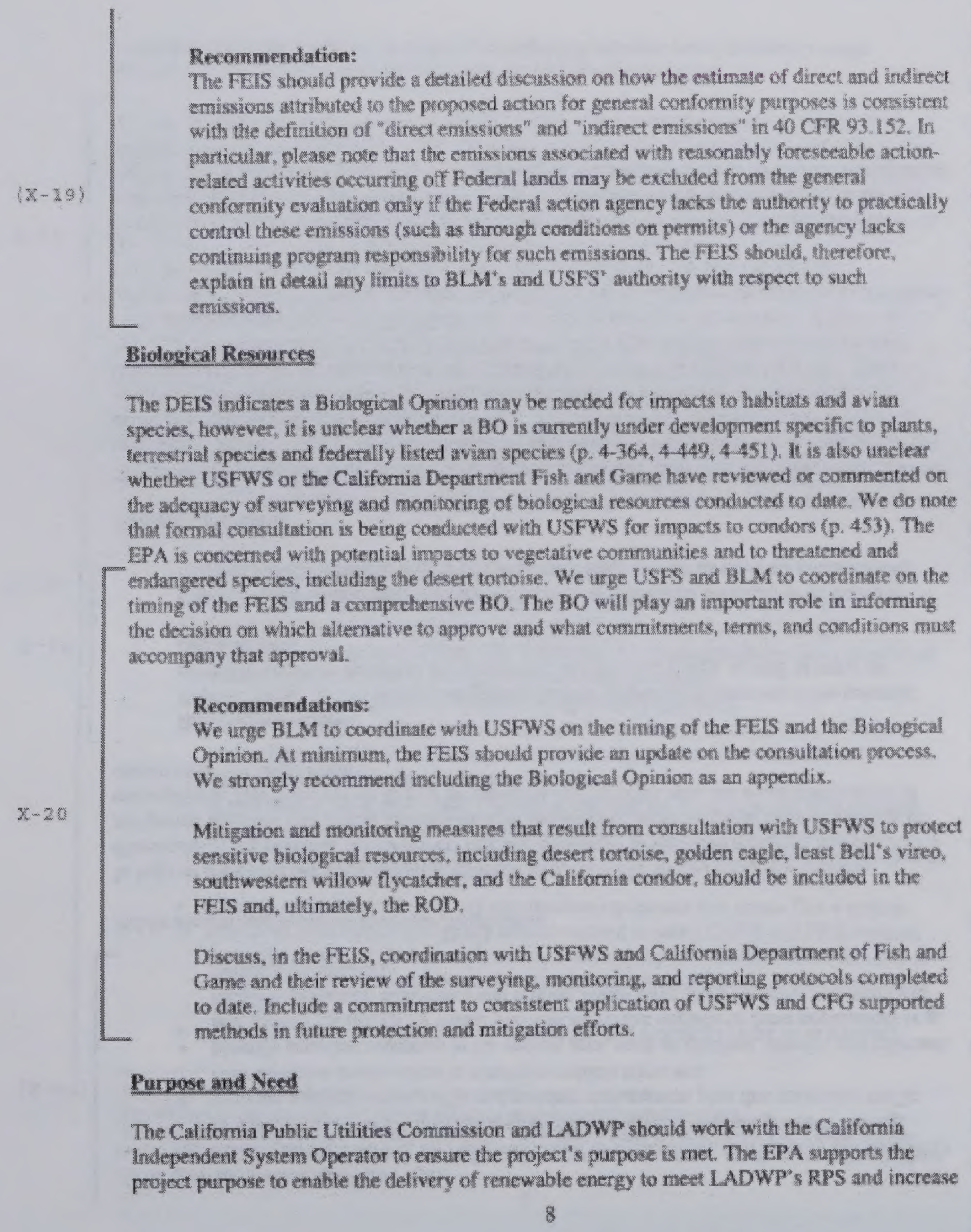
X-19

In addition to working with regional air quality agencies, the FS and BLM should consider consulting with the EPA prior to finalizing your general conformity determination. To consult with the EPA, please contact Dawn Richmond of the Air Division at (415) 972-3097, or by email at Richmond.Dawn@epa.gov.

Response X-18: A discussion of the health effects of criteria pollutants has been added to Table 3.2.1-1 in Chapter 3, Section 3.2.2, of the EIS/EIR. An expanded discussion of the health effects of pollutants has been added to Chapter 4, Section 4.2.1, on page 4-7 and 4-8 of the Final EIS/EIR.

General Practice GP-59, found in Table 2-8 in Chapter 2 of the Final EIS/EIR, has been modified to specify advance notice to residents for air quality and noise impacts specifically. As described in Chapter 4, Section 4.2.1 of the Final EIS/EIR, the risk to sensitive receptors from construction-related toxic air contaminants and particulate matter, including helicopter use, was found to be less than significant for all Alternatives due to the lack of sensitive receptors, their distance from each construction site, implementation of mitigation measure AIR-3, and the temporary nature of construction at each location. In the absence of substantial adverse impacts, not additional mitigation is necessary.

Response X-19: The specific requirements determined to be necessary for the proposed Project in order to complete construction activities on NFS lands and public lands managed by the BLM have been included in the analysis. Emissions taken into account in the analysis include transportation and support requirements occurring outside of NFS lands and public lands managed by the BLM necessary to complete the activities on NFS lands and public lands managed by the BLM. On-site air pollutant emissions during construction would principally consist of exhaust emissions from heavy-duty diesel- and gasoline-powered construction equipment, as well as fugitive particulate matter from earthmoving and material handling operations. Off-site exhaust emissions would result from workers commuting to and from the job site, as well as from trucks delivering material and equipment to the job sites within USFS and BLM lands. Both the proposed Project's direct and indirect emissions, as required by regulation



Recommendation:
The FEIS should provide a detailed discussion on how the estimate of direct and indirect emissions attributed to the proposed action for general conformity purposes is consistent with the definition of "direct emissions" and "indirect emissions" in 40 CFR 93.152. In particular, please note that the emissions associated with reasonably foreseeable action-related activities occurring off Federal lands may be excluded from the general conformity evaluation only if the Federal action agency lacks the authority to practically control these emissions (such as through conditions on permits) or the agency lacks continuing program responsibility for such emissions. The FEIS should, therefore, explain in detail any limits to BLM's and USFS' authority with respect to such emissions. (X-19)

Biological Resources

The DEIS indicates a Biological Opinion may be needed for impacts to habitats and avian species, however, it is unclear whether a BO is currently under development specific to plants, terrestrial species and federally listed avian species (p. 4-364, 4-449, 4-451). It is also unclear whether USFWS or the California Department Fish and Game have reviewed or commented on the adequacy of surveying and monitoring of biological resources conducted to date. We do note that formal consultation is being conducted with USFWS for impacts to condors (p. 453). The EPA is concerned with potential impacts to vegetative communities and to threatened and endangered species, including the desert tortoise. We urge USFS and BLM to coordinate on the timing of the FEIS and a comprehensive BO. The BO will play an important role in informing the decision on which alternative to approve and what commitments, terms, and conditions must accompany that approval.

Recommendations:
We urge BLM to coordinate with USFWS on the timing of the FEIS and the Biological Opinion. At minimum, the FEIS should provide an update on the consultation process. We strongly recommend including the Biological Opinion as an appendix.

X-20 Mitigation and monitoring measures that result from consultation with USFWS to protect sensitive biological resources, including desert tortoise, golden eagle, least Bell's vireo, southwestern willow flycatcher, and the California condor, should be included in the FEIS and, ultimately, the ROD.

Discuss, in the FEIS, coordination with USFWS and California Department of Fish and Game and their review of the surveying, monitoring, and reporting protocols completed to date. Include a commitment to consistent application of USFWS and CFG supported methods in future protection and mitigation efforts.

Purpose and Need

The California Public Utilities Commission and LADWP should work with the California Independent System Operator to ensure the project's purpose is met. The EPA supports the project purpose to enable the delivery of renewable energy to meet LADWP's RPS and increase

8

(40 CFR 93.153(b)), are included in the construction emission estimates. A discussion to this effect has been added to Section 4.2.1 of the Final EIS/EIR.

Response X-20: An update on required consultations and ongoing coordination with USFWS and CDFG, including their review of protocols, has been included in the Final EIS/EIR. A log of previous coordination with USFWS and CDFG is also included in Appendix D of the Biological Technical Report located in Volume IV of the Final EIS/EIR, and in the Biological Assessment, contained in Appendix H to the Final EIS/EIR, pages 4 through 6. All updates to mitigation measures resulting from USFWS consultation for the desert tortoise, golden eagle, least Bell's vireo, southwestern willow flycatcher, and California condor have been updated in the Final EIS/EIR.

their system reliability and flexibility in the utilization of renewable energy sources. The EPA also supports the appropriate development of renewable energy resources and reducing the use of fossil fuels for energy development as a critical step towards reducing major sources of greenhouse gasses that contribute to climate change. The proposed project would provide an important element toward overcoming transmission barriers to reaching renewable energy sources.

It is our understanding that the CAISO will ultimately decide what energy projects are permitted to connect to the proposed project, and that interconnection requests to the CAISO are approved based on the order they are received; therefore, there is currently no guarantee against other types of energy projects connecting prior to solar and wind projects.

X-21

Recommendations:
We strongly encourage the CPUC and LADWP to work with the CAISO to ensure that interconnection approval decisions would be consistent with the project purpose and would maximize, if not solely permit, wind and solar energy transmission.

The FEIS should include a discussion of the application and decision making process used by the CAISO to determine transmission line connection permits.

Cumulative Impacts and Connected Actions

Although some of the wind and solar projects proposed in the Tehachapi and Mojave Desert area may be located on private and State trust lands, while others are proposed on federal BLM lands, it appears many would be dependent on the federal permitting of the Barren Ridge transmission line and the construction and operation of the electrical switchyards. Thus, the impacts of constructing and operating the numerous wind and solar projects are considered relevant to BLM's and USFS's approval or denial of the proposed project. Further, potential impacts to condors, golden eagles and other avian species could hinder the approval of a number of the proposed wind projects in the Tehachapi area.

X-22

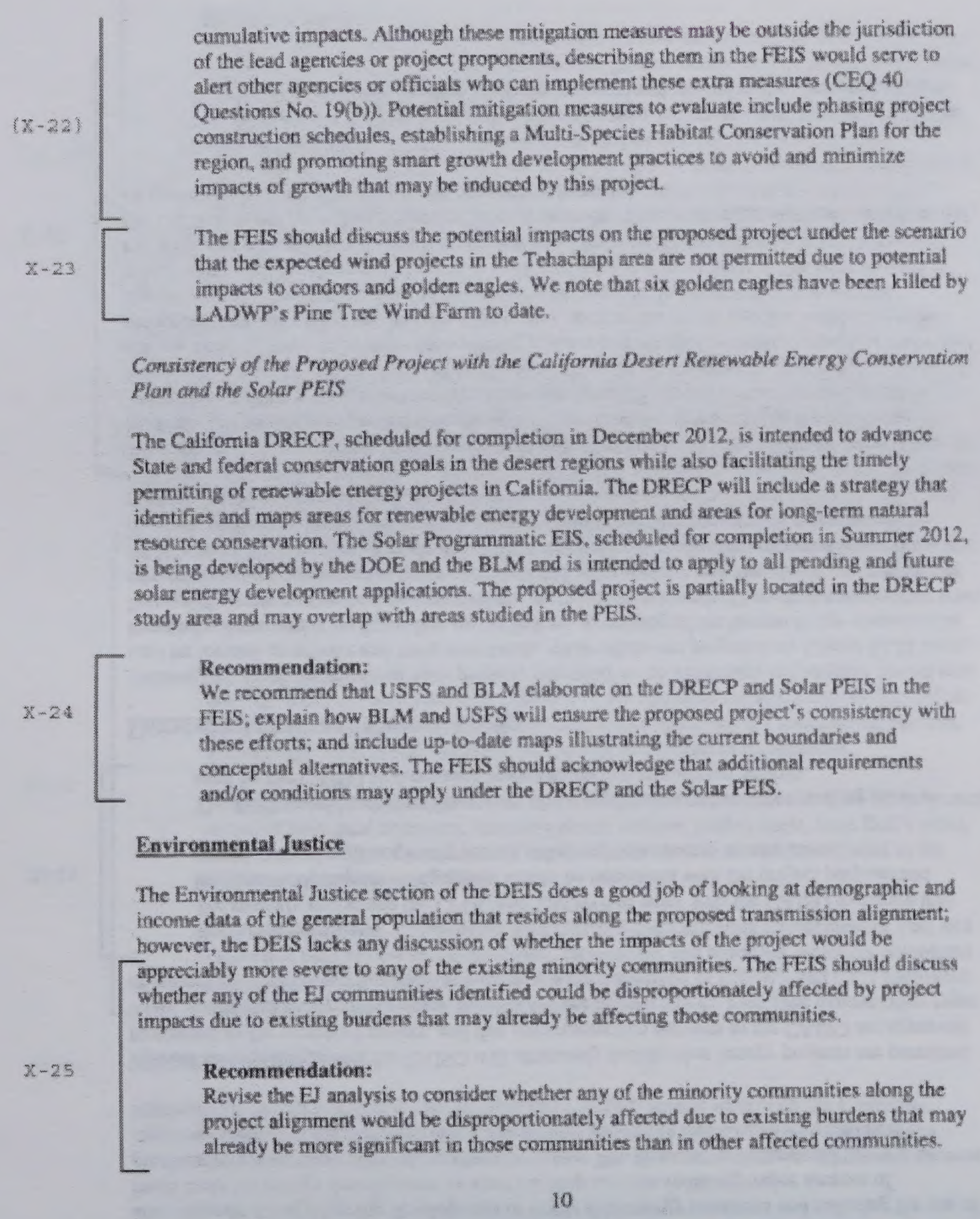
We support a proxy analysis for the impacts of proposed wind and solar based on the size, location, and resource impacts for the number of solar and wind projects the Barren Ridge Transmission Line would accommodate; however, it is difficult to evaluate the full extent of impacts of the proposed action based on the analysis in the Cumulative Effects chapter. Many of the potential cumulative impacts for hydrology, water and air quality, noise, biological and visual resources, and threatened and endangered species, such as the desert tortoise, would likely be significant and unavoidable due to the level of past, present, and reasonably foreseeable construction and development projects in wind and solar resources areas at the northern end of the proposed transmission line. While we recognize the qualitative cumulative impact analysis, the DEIS does not quantify impacts nor does it describe or evaluate mitigation measures to avoid or minimize the identified significant cumulative impacts.

Recommendations:
The FEIS should quantify cumulative impacts across resources areas, as well as describe and evaluate feasible mitigation measures to avoid and minimize the identified adverse

Response X-21: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP. Please refer to Response X-6 above. We have included a brief description of the interconnection process in the Final EIS/EIR on page 2-93 through 2-94.

Refer to Response X-6. LADWP's interconnection process does not involve CAISO.

Response X-22: Reasonably foreseeable wind and solar projects that might transmit power through the BRRTP would have similar impacts to each other, particularly those in the Antelope Valley and other locations north of the ANF; as such, we are able to identify the types of impacts that would likely result from construction and operation of such projects. These impacts have been added to Chapter 5 of the Final EIS/EIR in Section 5.2.5.



(X-22) cumulative impacts. Although these mitigation measures may be outside the jurisdiction of the lead agencies or project proponents, describing them in the FEIS would serve to alert other agencies or officials who can implement these extra measures (CEQ 40 Questions No. 19(b)). Potential mitigation measures to evaluate include phasing project construction schedules, establishing a Multi-Species Habitat Conservation Plan for the region, and promoting smart growth development practices to avoid and minimize impacts of growth that may be induced by this project.

X-23 The FEIS should discuss the potential impacts on the proposed project under the scenario that the expected wind projects in the Tehachapi area are not permitted due to potential impacts to condors and golden eagles. We note that six golden eagles have been killed by LADWP's Pine Tree Wind Farm to date.

Consistency of the Proposed Project with the California Desert Renewable Energy Conservation Plan and the Solar PEIS

The California DRECP, scheduled for completion in December 2012, is intended to advance State and federal conservation goals in the desert regions while also facilitating the timely permitting of renewable energy projects in California. The DRECP will include a strategy that identifies and maps areas for renewable energy development and areas for long-term natural resource conservation. The Solar Programmatic EIS, scheduled for completion in Summer 2012, is being developed by the DOE and the BLM and is intended to apply to all pending and future solar energy development applications. The proposed project is partially located in the DRECP study area and may overlap with areas studied in the PEIS.

X-24 **Recommendation:**
We recommend that USFS and BLM elaborate on the DRECP and Solar PEIS in the FEIS; explain how BLM and USFS will ensure the proposed project's consistency with these efforts; and include up-to-date maps illustrating the current boundaries and conceptual alternatives. The FEIS should acknowledge that additional requirements and/or conditions may apply under the DRECP and the Solar PEIS.

Environmental Justice

The Environmental Justice section of the DEIS does a good job of looking at demographic and income data of the general population that resides along the proposed transmission alignment; however, the DEIS lacks any discussion of whether the impacts of the project would be appreciably more severe to any of the existing minority communities. The FEIS should discuss whether any of the EJ communities identified could be disproportionately affected by project impacts due to existing burdens that may already be affecting those communities.

X-25 **Recommendation:**
Revise the EJ analysis to consider whether any of the minority communities along the project alignment would be disproportionately affected due to existing burdens that may already be more significant in those communities than in other affected communities.

10

Response X-23: There would be no impacts to the proposed Project if expected wind projects in the Tehachapi area are not permitted due to potential impacts to condors and golden eagles. Even without the permitting of any specific Tehachapi-area wind projects, adequate resources would still be expected to allow for the interconnection and expansion of LADWP's renewable energy in the Tehachapi Mountains and Mojave Desert areas. The BRRTP is not dependent on the permitting of any specific projects. We have added an explanation of this into the Final EIS/EIR in Section 1.2.4.

Response X-24: See Response X-4 above.

Response X-25: We have added a community analysis section in the Environmental Justice Section (refer to Section 6.6.12) in the Final EIS/EIR, which states that minority communities have not been disproportionately affected. The Environmental Justice analysis showed that Block Groups (i.e., census groupings) within six miles of any Project Alternative that contained Environmental Justice communities were relatively few, and tables showing extrapolated data have been included in the Final EIS/EIR. The Alternatives traverse and are proximate to areas that are less disadvantaged, under Environmental Justice definitions, than the region as a whole. This lack of disadvantaged communities indicates that, overall, the Alternatives would not have significant adverse Environmental Justice impacts.

A six-mile radius from the Project action alternatives was used to assess the potential dust, noise, air pollutant, and electromagnetic impacts to communities. Types of construction noise, dust, other air pollutants, visual impacts, and potential land value impacts (to the extent they occur) would be similar along all action alternatives, because the construction techniques would be essentially the same. Helicopter construction as mitigation would

Cultural Resources and Coordination with Tribal Governments

Tribes have expressed concerns regarding large-scale solar and wind projects and it is especially important that effective tribal consultation occur for a project providing potential access to vast solar and wind resources in the Tehachapi and Mojave Desert area. Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes.

X-26

Recommendation:
The FEIS should discuss how the any concerns raised by Tribes were addressed and resolved. Provide an update on the status of the Programmatic Agreement and whether coordination with Tribes is occurring. The FEIS should indicate whether the Tribes are in agreement that the Programmatic Agreement will reduce impacts to prehistoric and sacred sites to less than significant. We recommend that all measures to reduce impacts to tribal and cultural resources be adopted in the ROD.

Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act, which requires a federal agency, upon determining that activities under its control could affect historic properties, to consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO) and consider the effects of its actions on cultural resources, following regulation in 36 CFR 800. Under NEPA, any impacts to tribal, cultural, or other treaty resources, and measures that could mitigate those impacts, must be discussed in the EIS.

Executive Order 13007, *Indian Sacred Sites* (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

X-27

Recommendation:
The FEIS should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how the BLM will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist.

Tower Design

The proposed project would primarily use lattice steel towers (LSTs) instead of tubular steel towers (TSPs). Reduced bird-kills, as well as reduced visual impacts, are noted benefits of TSPs. We also note that TSPs have been proposed by LADWP as an available mitigation structure where appropriate to reduce potential impacts, such as conflicts with cultivation on agricultural lands (p. 2-51). The EPA supports the use of the TSPs over LSTs for all the reasons above and is

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occur only in the ANF, affecting no Environmental Justice communities. Thus, regardless of whether the nearby affected populations would be minority and/or low-income or not, the actual pathways and magnitudes of the impacts would be equivalent.

Property value impacts from transmission lines, if any, would generally occur nearby transmission facilities (refer to page 4-342 of the Final EIS/EIR). Likewise, other community impacts from land-use conflicts or disruption would also be localized.

Response X-26: The Final EIS/EIR has been updated with an explanation of current Tribal concerns on page 7-20.

Response X-27: A discussion of Executive Order 13007 has been added to Section 6.6.3 in the Final EIS/EIR. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

pleased the 3 Circuit mitigation measure specifies the use of TSPs for towers that would be in close proximity to the existing residential area of Green Valley.

X-28

Recommendation:
Consider utilizing TSPs for the length of project, and, at a minimum, include a mitigation measure that specifies the use of TSPs in natural settings near areas frequented by recreational users, such as in proximity to the Pacific Crest Trail, and near residences in close proximity to the project.

Noise

X-29

The FEIS should explore and describe additional mitigation measures to reduce or screen mobile equipment noise. Mobile construction equipment activities would violate the Los Angeles County noise standards even with proposed mitigation measures (p. 4-74).

Recommendation:
We recommend the project proponents and lead federal and State agencies explore additional mitigation measures to reduce or screen mobile equipment noise. If these measures are technologically and economically feasible, the FEIS should describe and consider implementation of the measures.

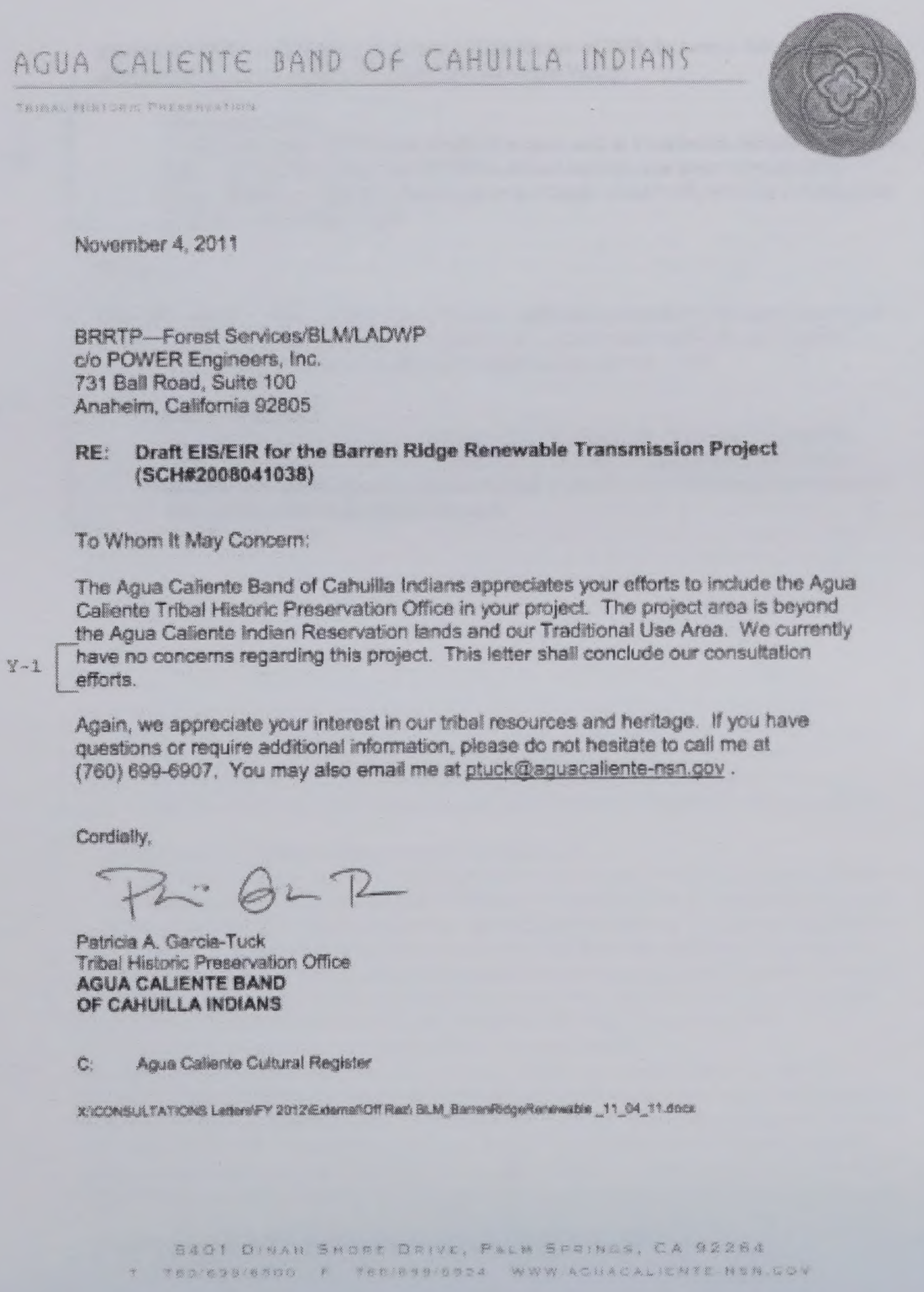
Response X-28: We have included analysis in the Final EIS/EIR in Section 4.2.9 that explains the visual advantages and disadvantages of both Lattice Steel Towers (LSTs) and Tubular Steel Poles (TSPs).

In summary, the comparative analysis added to Section 3.2.9 of the Final EIS/EIR shows that TSPs are more aesthetically pleasing because of the architectural rather than engineered visual character of the structures, and because they have a smaller footprint. They may be more appropriate in the immediate foreground or foreground from sensitive viewpoints (e.g., Green Valley), but tend to be more prominent at greater distances than LSTs. The open lattice frame structure characteristic of LSTs, and the darkening of the steel structural members of the LSTs, allows much better blending where the structures would be seen against more visually diverse, textured backdrops often present in the ANF. LSTs also allow greater spans and fewer structures while allowing for maximum offsets when crossing visually sensitive linear features, such as trails, and would be better absorbed into the existing corridor where LSTs already exist.

If TSPs were installed in Green Valley, identifying where to begin and end the TSP span would need to be considered so that it would break off cleanly into the LST segments on the ANF. There are also some concerns over the visual contrast that would result with installing a TSP segment that would parallel existing LST segments. However, this could set a new standard, and when future utility projects or upgrades are implemented within the Green Valley ROW, the utilities/proponents could also be required to use TSPs, and a new uniformity can be established. Therefore, the use of TSPs in Green Valley would be a trade-off that would require community input. The feasibility of using TSPs must also be determined during final engineering when considering environmental, structural, and implementation constraints.

Response X-29: Three new General Practices, GP-60, GP-61, and GP-62, have been incorporated into the description of the Project in Chapter 2, Table 2-8, of the Final EIS/EIR. These new General Practices, previously committed to in Section 4.2.2 of the Draft EIS/EIR as Standard Practices, require the use of noise reduction equipment, use of sound walls to shield adjacent residents, and limiting of unnecessary engine idling time. With the incorporation of these new General Practices, additional mitigation measures for mobile equipment noise are not necessary.

LETTER Y: AGUA CALIENTE BAND OF CAHUILLA INDIANS



AGUA CALIENTE BAND OF CAHUILLA INDIANS
TRIBAL HISTORIC PRESERVATION

November 4, 2011

BRRTP—Forest Services/BLM/LADWP
c/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, California 92805

RE: **Draft EIS/EIR for the Barren Ridge Renewable Transmission Project (SCH#2008041038)**

To Whom It May Concern:

The Agua Caliente Band of Cahuilla Indians appreciates your efforts to include the Agua Caliente Tribal Historic Preservation Office in your project. The project area is beyond the Agua Caliente Indian Reservation lands and our Traditional Use Area. Y-1 We currently have no concerns regarding this project. This letter shall conclude our consultation efforts.

Again, we appreciate your interest in our tribal resources and heritage. If you have questions or require additional information, please do not hesitate to call me at (760) 699-6907. You may also email me at ptuck@aguacaliente-nsn.gov .

Cordially,

Patricia A. Garcia-Tuck
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

C: Agua Caliente Cultural Register

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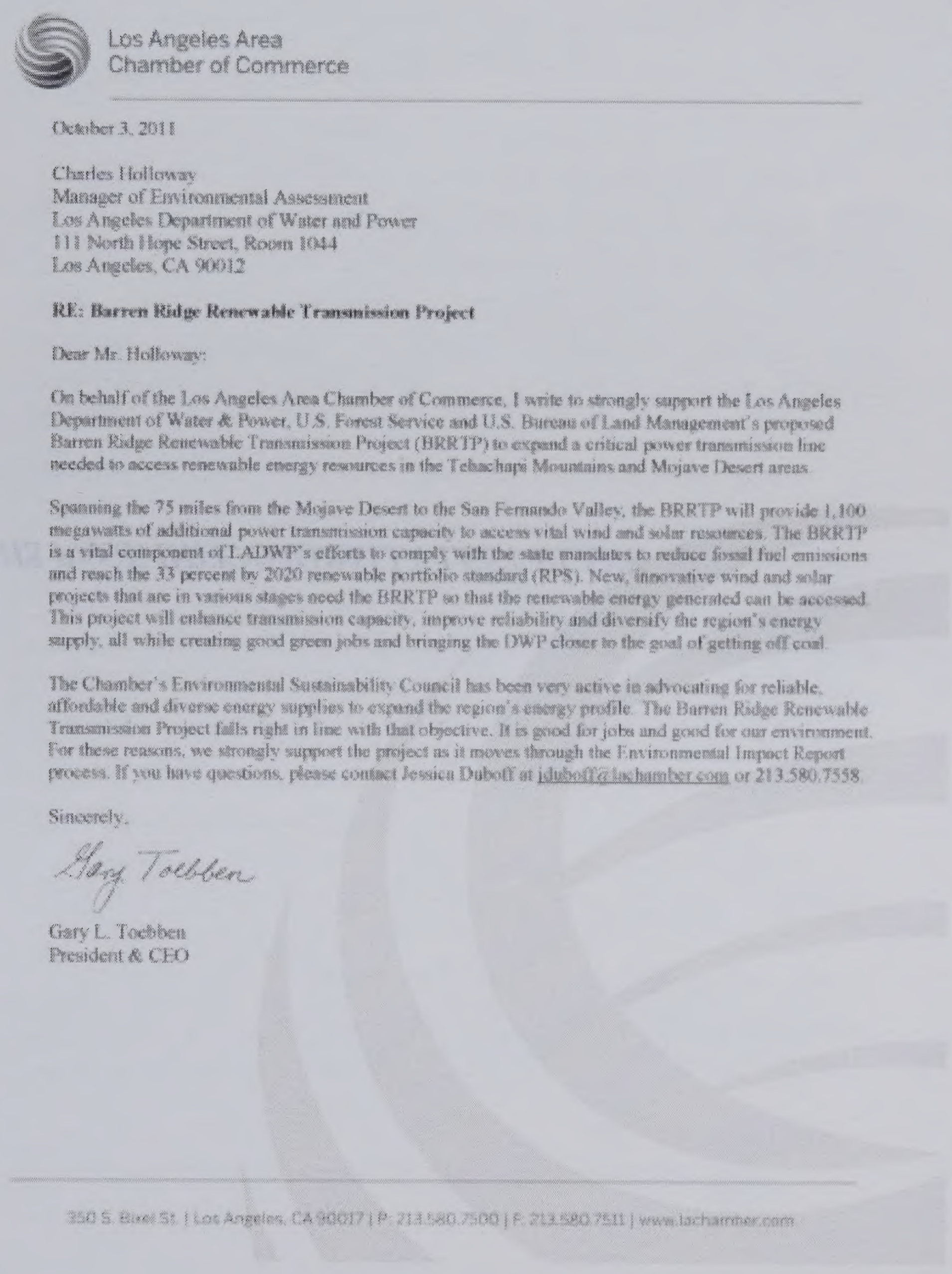
5401 DINAH SHORE DRIVE, PALM SPRINGS, CA 92264
T 760/699/6800 F 760/699/6924 WWW.AGUACALIENTE-NSN.GOV

Response Y-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP

LETTER Z: LOS ANGELES AREA CHAMBER OF COMMERCE



Los Angeles Area
Chamber of Commerce

October 3, 2011

Charles Holloway
Manager of Environmental Assessment
Los Angeles Department of Water and Power
111 North Hope Street, Room 1044
Los Angeles, CA 90012

RE: Barren Ridge Renewable Transmission Project

Dear Mr. Holloway:

On behalf of the Los Angeles Area Chamber of Commerce, I write to strongly support the Los Angeles Department of Water & Power, U.S. Forest Service and U.S. Bureau of Land Management's proposed Barren Ridge Renewable Transmission Project (BRRTP) to expand a critical power transmission line needed to access renewable energy resources in the Tehachapi Mountains and Mojave Desert areas.

Spanning the 75 miles from the Mojave Desert to the San Fernando Valley, the BRRTP will provide 1,100 megawatts of additional power transmission capacity to access vital wind and solar resources. The BRRTP is a vital component of LADWP's efforts to comply with the state mandates to reduce fossil fuel emissions and reach the 33 percent by 2020 renewable portfolio standard (RPS). New, innovative wind and solar projects that are in various stages need the BRRTP so that the renewable energy generated can be accessed. This project will enhance transmission capacity, improve reliability and diversify the region's energy supply, all while creating good green jobs and bringing the DWP closer to the goal of getting off coal.

The Chamber's Environmental Sustainability Council has been very active in advocating for reliable, affordable and diverse energy supplies to expand the region's energy profile. The Barren Ridge Renewable Transmission Project falls right in line with that objective. It is good for jobs and good for our environment. For these reasons, we strongly support the project as it moves through the Environmental Impact Report process. If you have questions, please contact Jessica Duboff at jduboff@lachamber.com or 213.580.7558.

Sincerely,

Gary Toebben

Gary L. Toebben
President & CEO

350 S. Bixel St. | Los Angeles, CA 90017 | P: 213.580.7500 | F: 213.580.7511 | www.lachamber.com

Response Z-1: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

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PART 3: SETS OF COMMENTS FROM INDIVIDUALS AND RESPONSES

Part three of this appendix contains all individual sets of comments received during the public comment period. Comments were submitted via letters, emails, mailed comment forms, and Project hotline messages. A copy of each substantive comment and the response from the lead agencies are provided in this section. The sets of comments are labeled numerically and responses are labeled alphabetically. For example, Response 1-A refers to the response to the first comment in comment letter 1.

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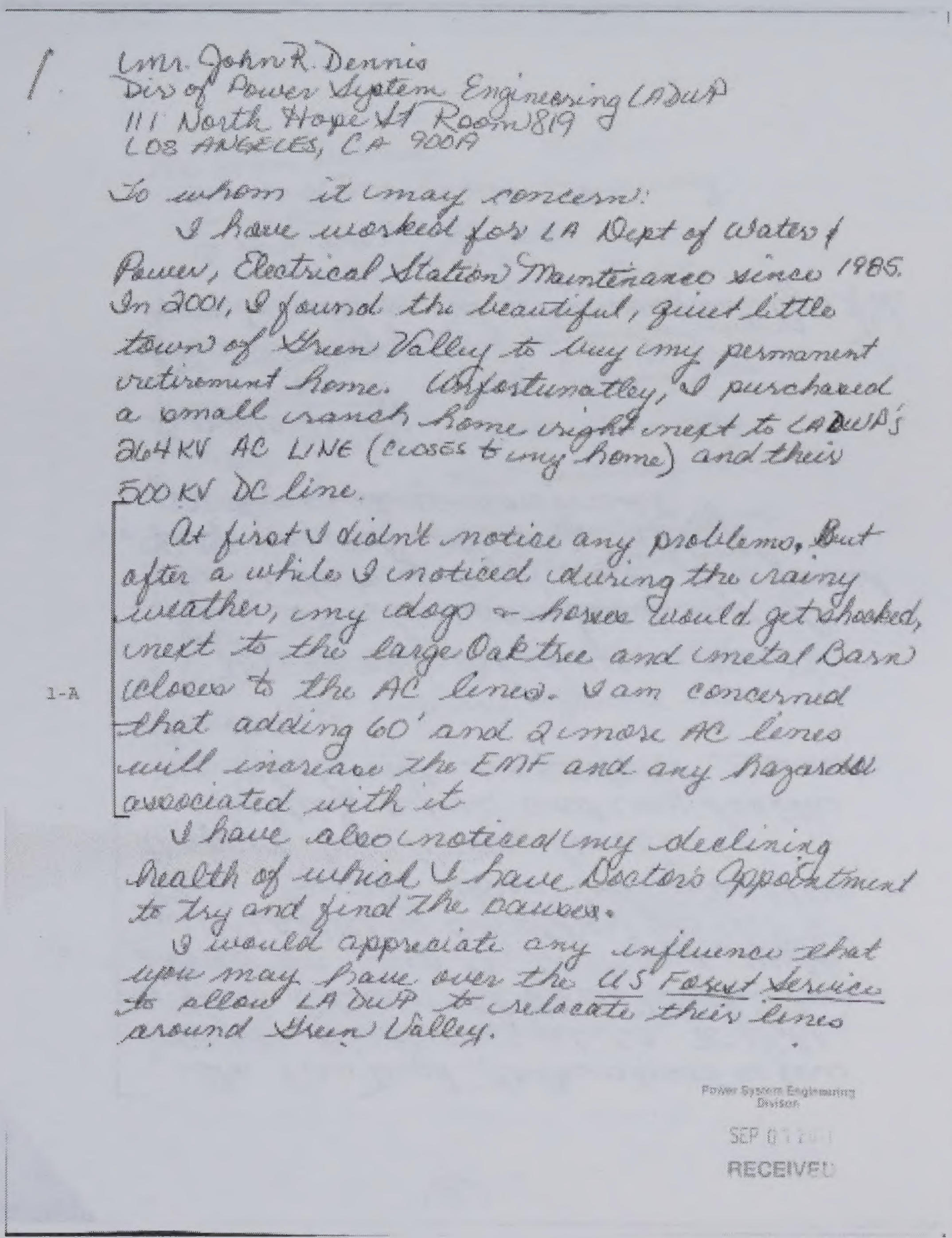
INDIVIDUAL COMMENT LETTER 1: AJAX, D.



1.

Mr. John R. Dennis
Dir of Power System Engineering LADWP
111 North Hope St Room 819
LOS ANGELES, CA 900A

To whom it may concern:

I have worked for LA Dept of Water & Power, Electrical Station Maintenance since 1985. In 2001, I found the beautiful, quiet little town of Green Valley to buy my permanent retirement home. Unfortunately, I purchased a small ranch home right next to LADWP's 264KV AC LINE (closes to my home) and their 500KV DC line.

1-A At first I didn't notice any problems, But after a while I noticed during the rainy weather, my dogs & horses would get shocked, next to the large Oak tree and metal Barn closes to the AC lines. I am concerned that adding 60' and 2 more AC lines will increase the EMF and any hazards associated with it

I have also noticed my declining health of which I have Doctor's Appointment to try and find the causes.

I would appreciate any influence that you may have over the US Forest Service to allow LA DWP to relocate their lines around Green Valley.

Power System Engineering
Divison
SEP 07 2011
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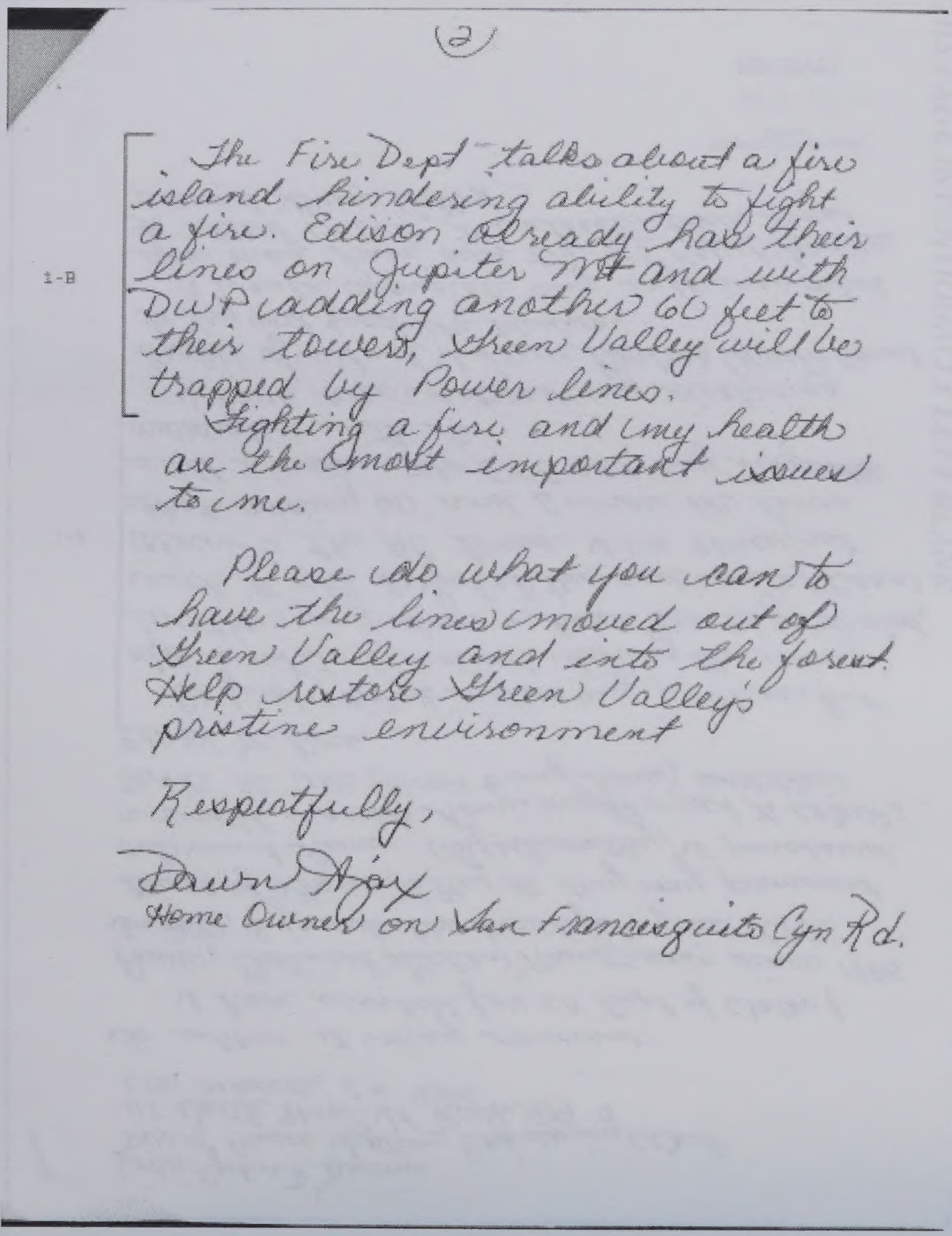
Response 1-A: Electrical shocks of the type you identify in your comment can and would be mitigated. LADWP's Electric and Magnetic Fields (EMF) group can provide complimentary testing of EMF levels around properties. Consequently, any potential anomalies can be identified and appropriate mitigation recommended. The LADWP EMF Inquiry Line can be reached at (213) 367-2616. As described in Section 4.2.12 of the Final EIS/EIR, the addition of the new BRRTP 230 kV double-circuit transmission line would not increase EMF levels above the existing EMF levels because the design and operation of the two 230 kV circuits would cause cancellation effects, which would reduce the EMF levels.



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1-B The Fire Dept talks about a fire island hindering ability to fight a fire. Edison already has their lines on Jupiter Mt and with DWP adding another 60 feet to their towers, Green Valley will be trapped by Power lines.

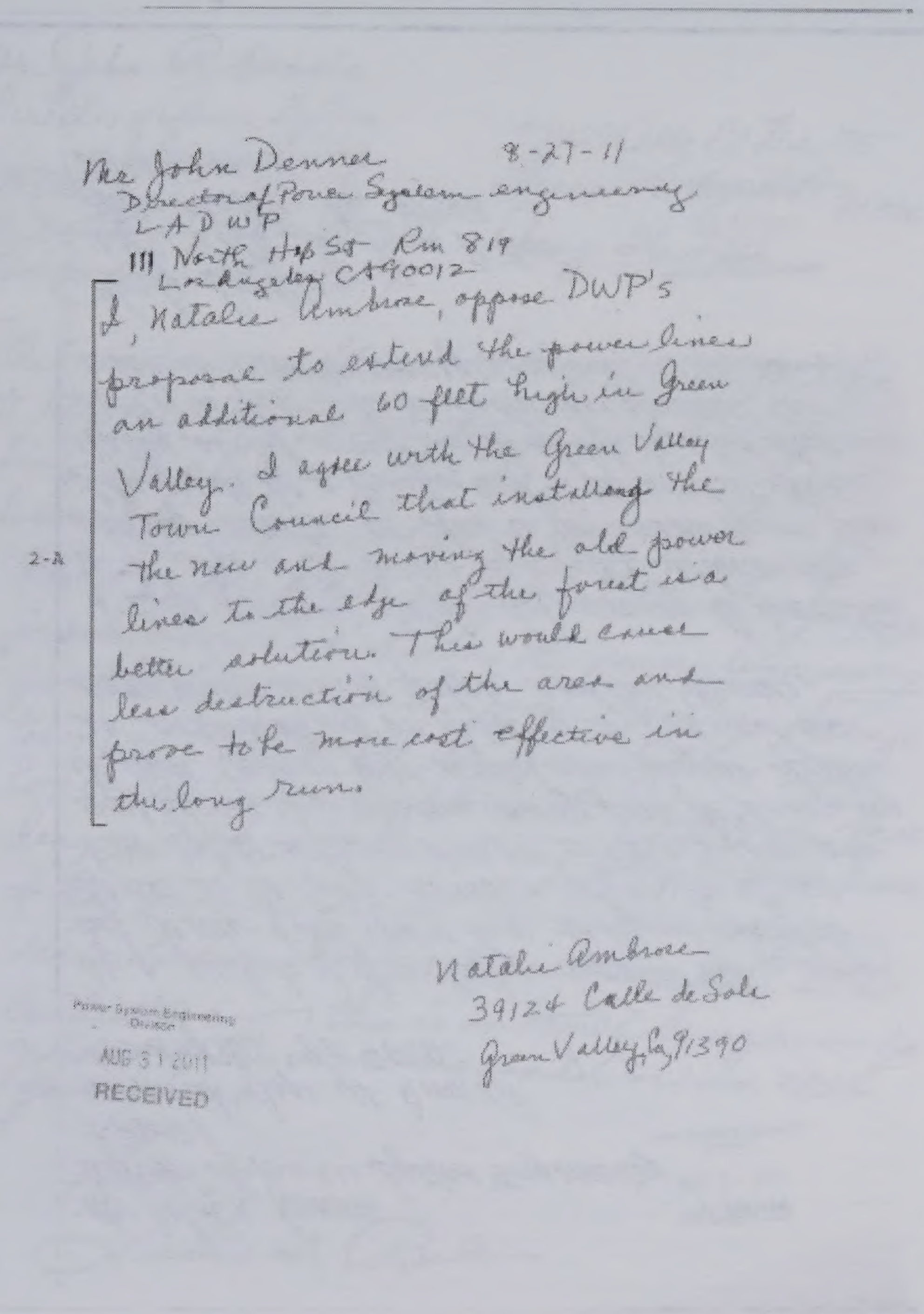
Fighting a fire and my health are the most important issues to me.

Please do what you can to have the lines moved out of Green Valley and into the forest. Help restore Green Valley's pristine environment

Respectfully,

Dawn Hay
Home Owner on San Francisquito Cyn Rd.

Response 1-B: The Proposed Action would not create any indefensible firefighting spaces, as is the case with Alternative 2a, and this is a significant reason why Alternative 2a was not the Federal Agency Preferred or Environmentally Superior Alternative. Please refer to Section 3.2.11 and Section 4.2.11 of the Final EIS/EIR for the discussion of potential impacts to wildfire and fuels for each Alternative.



Mr John Denner 8-27-11
Director of Power System engineering
LADWP
111 North Hop St Rm 819
Los Angeles CA 90012

2-A I, Natalie Ambrose, oppose DWP's proposal to extend the power lines an additional 60 feet high in Green Valley. I agree with the Green Valley Town Council that installing the new and moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective in the long run.

Natalie Ambrose
39124 Calle de Sole
Green Valley, Ca 91390

Power System Engineering Division
AUG 31 2011
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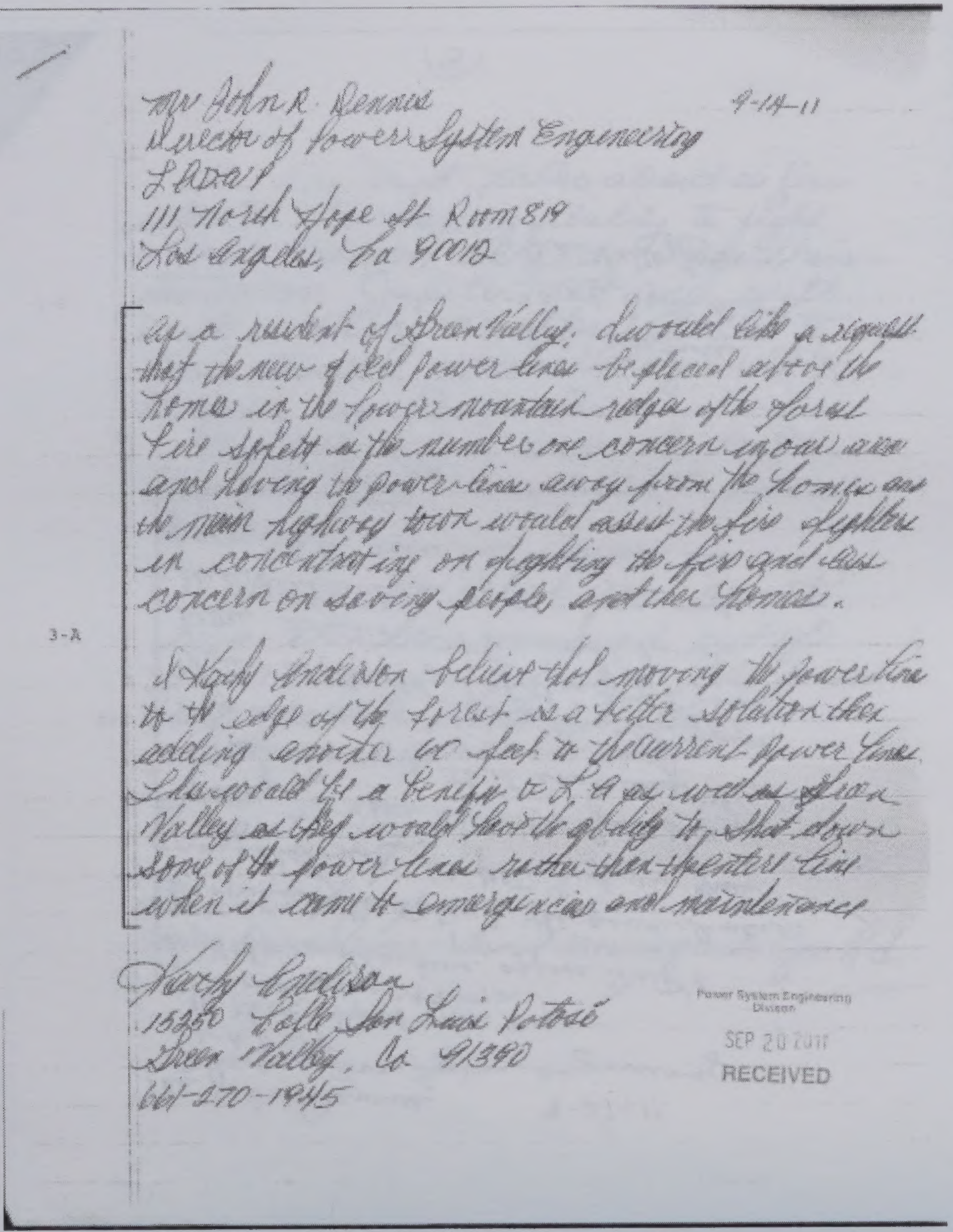
INDIVIDUAL COMMENT LETTER 2: AMBROSE, N.

Response 2-A:

As a result of public comments on the Draft EIS/EIR, a new alternative in the Green Valley area, the Green Valley Multi-Line Relocation Alternative, was examined, which would locate the proposed double-circuit 230 kV and relocate the existing single-circuit 230 kV and 500 kV DC lines into a new corridor primarily in the ANF and just outside of the community. See pages 2-31 through 2-36 of the Final EIS/EIR for a full description of this alternative. As described there, the proposed route of the Green Valley Multi-Line Relocation Alternative was determined to be a feasible location for the proposed re-route. The Green Valley Multi-Line Relocation Alternative was considered but eliminated from detailed analysis in the Final EIS/EIR because it would not avoid or minimize environmental impacts as compared to the Proposed Action.



Mr John R. Dennis 9-14-11
Director of Power System Engineering
LADWP
111 North Hope St Room 819
Los Angeles, Ca 90012

3-A

As a resident of Green Valley, I would like a request that the new power lines be placed above the homes in the lower mountain ridges of the forest. Fire safety is the number one concern in our area and moving the power lines away from the homes and the main highway too would assist the fire fighters in concentrating on fighting the fire and less concern on saving people, and their homes.

I Kathy Anderson believe that moving the power line to the edge of the forest is a better solution than adding another 100 feet to the current power line. This would be a benefit to LA as well as Green Valley as they would have the ability to shut down some of the power lines rather than the entire line when it comes to emergencies and maintenance

Kathy Anderson
15250 Calle San Luis Potosi
Green Valley, Ca 91390
661-270-1945

Power System Engineering
Division
SEP 20 2011
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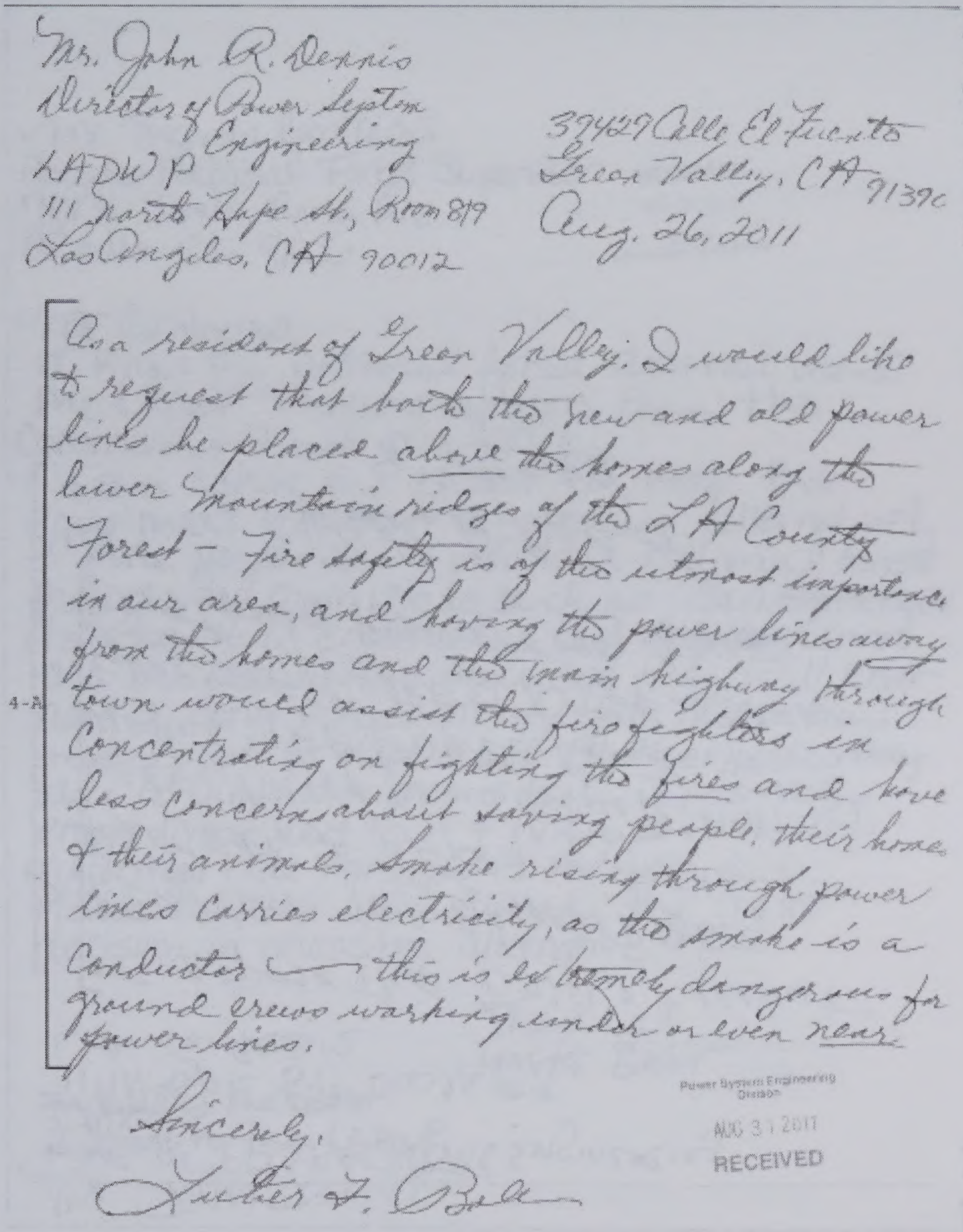
INDIVIDUAL COMMENT LETTER 3: ANDERSON, K.

Response 3-A: Firefighting is a very important factor in the BRRTP environmental review process. Please refer to Section 3.2.11 and Section 4.2.11 of the Final EIS/EIR for a complete analysis of the fire risks associated with each Alternative. Also please refer to Response 2-A.



Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St, Room 819
Los Angeles, CA 90012

39429 Calle El Fuento
Green Valley, CA 91390
Aug. 26, 2011

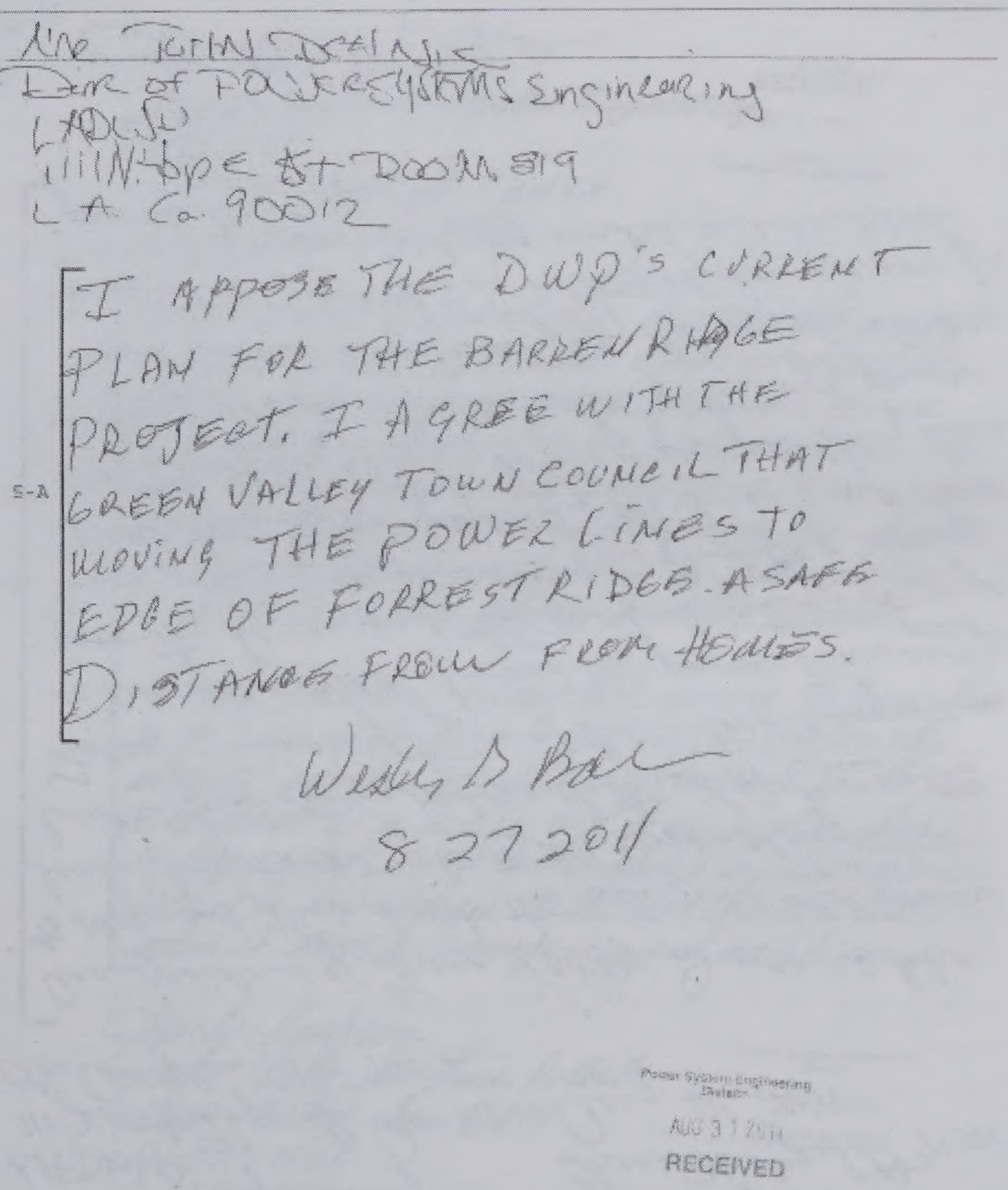
As a resident of Green Valley, I would like to request that both the new and old power lines be placed above the homes along the lower mountain ridges of the LA County Forest – Fire safety is of the utmost importance in our area, and having the power lines away from the homes and the main highway through
4-A town would assist the fire fighters in concentrating on fighting the fires and have less concern about saving people, their homes & their animals. Smoke rising through power lines carries electricity, as the smoke is a conductor — this is extremely dangerous for ground crews working under or even near power lines.

Sincerely,
Luther F. Bale

Power System Engineering Division
AUG 31 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 4: BALE, L.

Response 4-A: Firefighting is a very important factor in the BRRTP environmental review process. Please refer to Section 3.2.11 and Section 4.2.11 of the Final EIS/EIR for a complete analysis of the fire risks associated with each Alternative. Also please refer to Response 2-A.



Mr John Dennis
Dir of Power Systems Engineering
LADWP
1111 N. Hope St Room 819
L A Ca 90012

5-A I APPOSE THE DWP'S CURRENT PLAN FOR THE BARREN RIDGE PROJECT. I AGREE WITH THE GREEN VALLEY TOWN COUNCIL THAT MOVING THE POWER LINES TO EDGE OF FORREST RIDGE. A SAFE DISTANCE FROM FROM HOMES.

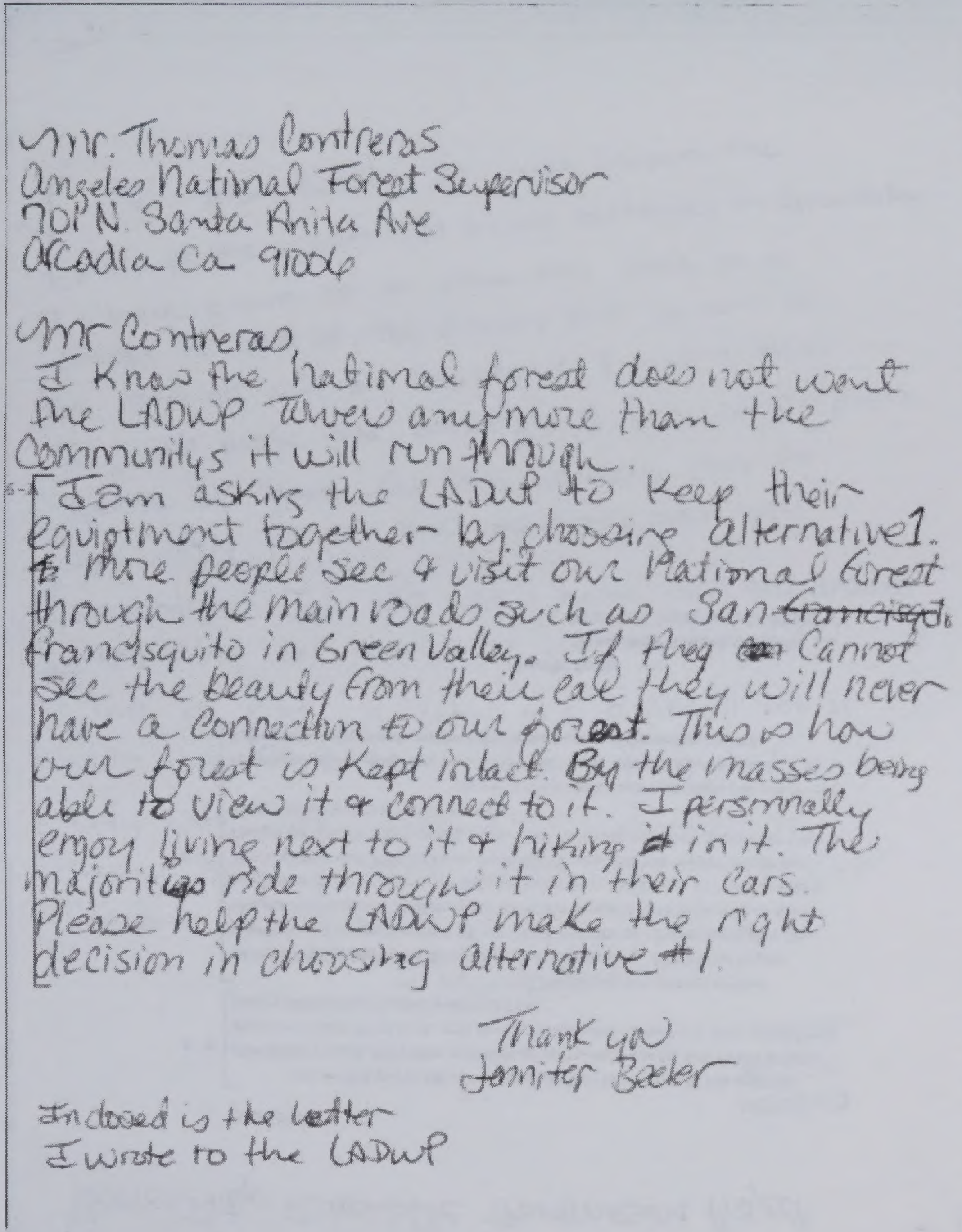
Wesley D Ball
8 27 2011

Power System Engineering
Division
AUG 31 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 5: BALL, W.

Response 5-A: Please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 6: BEELER, J.



Mr. Thomas Contreras
Angeles National Forest Supervisor
701 N. Santa Anita Ave
Arcadia Ca 91006

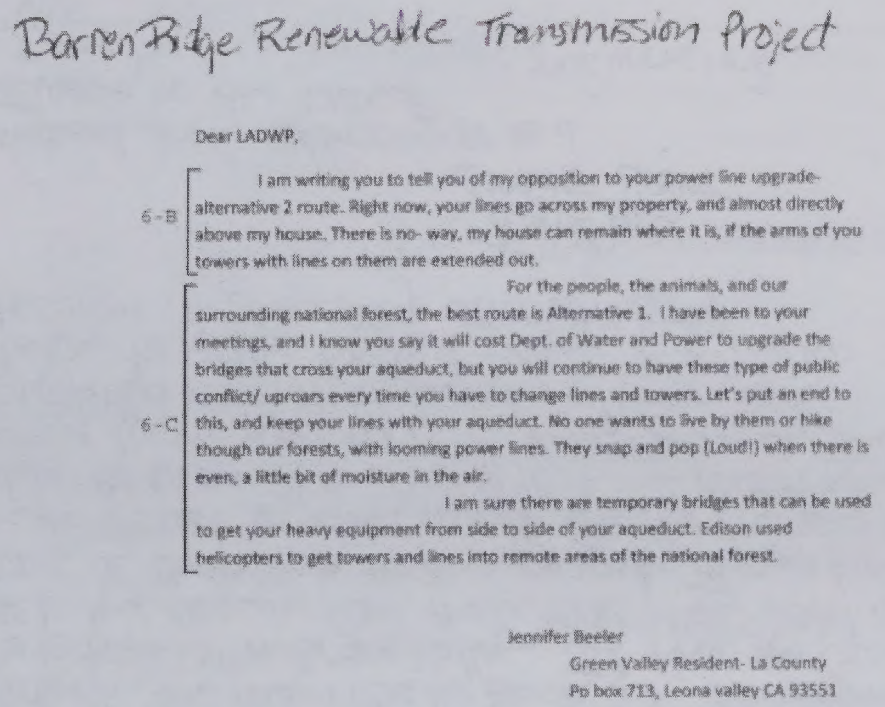
Mr Contreras,
I Know the national forest does not want the LADWP Tower any more than the Communitys it will run through.

6-A I am asking the LADWP to Keep their equiptment together by choosing alternative1. ~~to~~ More people see & visit our National Forest through the main roads such as San ~~Francisqu~~ Francisquito in Green Valley. If they ~~ca~~ Cannot see the beauty from their car they will never have a connection to our forest. This is how our forest is Kept intact. By the masses being able to view it & connect to it. I personally enjoy living next to it & hiking ~~it~~ in it. The majority ride through it in their cars. Please help the LADWP make the right decision in choosing alternative #1.

Thank you
Jennifer Beeler

Enclosed is the letter
I wrote to the LADWP

Response 6-A: Alternative 1 is not identified as the Federal Agency Preferred or Environmentally Superior Alternative in the Final EIS/EIR because of overall higher impacts associated with this Alternative. A description of the rationale to select Alternative 2 as the Federal Agency Preferred and Environmentally Superior Alternative is found in the Final EIS/EIR in Sections 2.7 and 2.8. Documentation and comparison of the impacts of each of the Alternatives, including Alternative 1, are found in the Final EIS/EIR in Section 2.6.6 and Table 2-11.



Barren Ridge Renewable Transmission Project

Dear LADWP,

6-B I am writing you to tell you of my opposition to your power line upgrade- alternative 2 route. Right now, your lines go across my property, and almost directly above my house. There is no- way, my house can remain where it is, if the arms of you towers with lines on them are extended out.

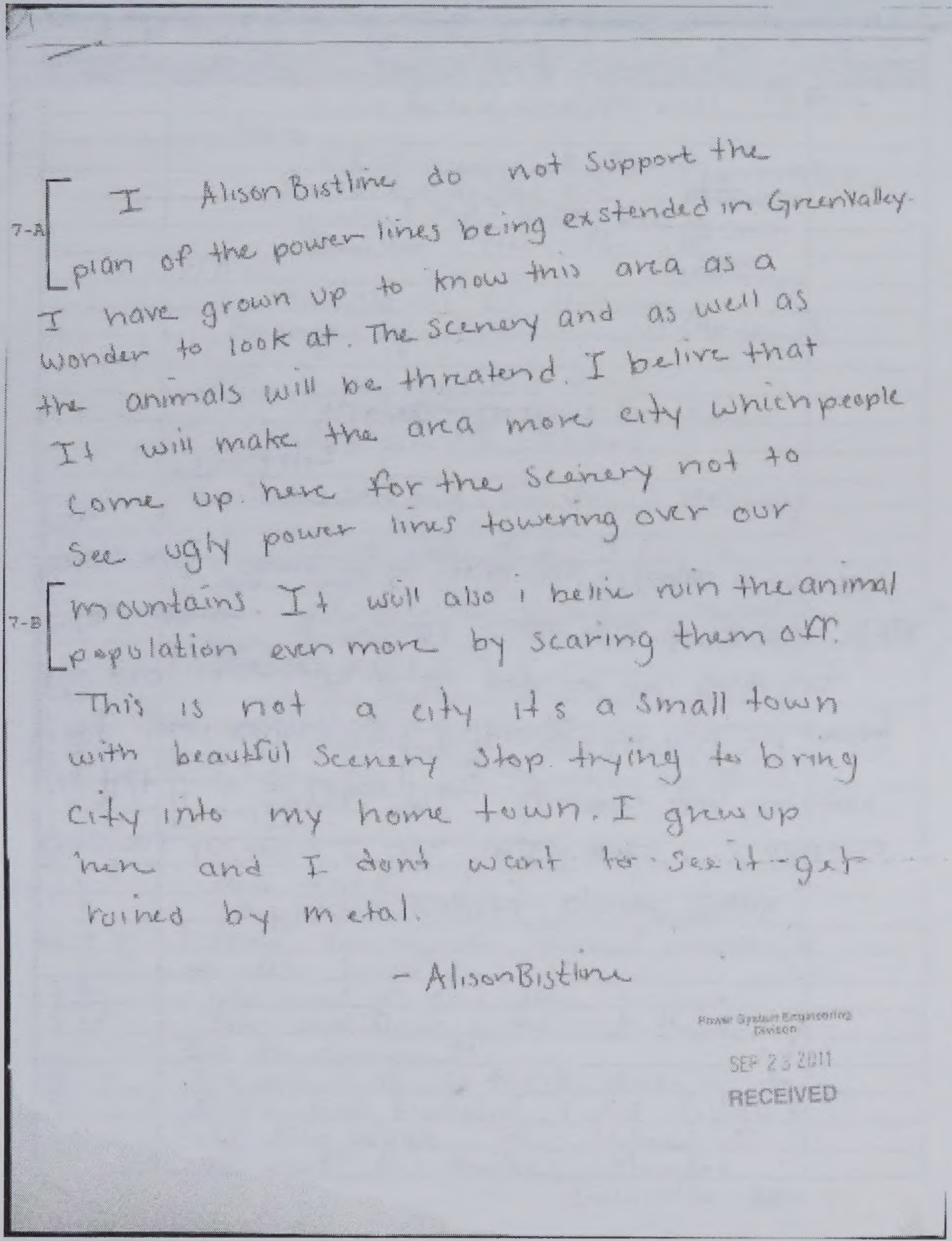
6-C For the people, the animals, and our surrounding national forest, the best route is Alternative 1. I have been to your meetings, and I know you say it will cost Dept. of Water and Power to upgrade the bridges that cross your aqueduct, but you will continue to have these type of public conflict/ uproars every time you have to change lines and towers. Let's put an end to this, and keep your lines with your aqueduct. No one wants to live by them or hike though our forests, with looming power lines. They snap and pop (Loud!) when there is even, a little bit of moisture in the air.

I am sure there are temporary bridges that can be used to get your heavy equipment from side to side of your aqueduct. Edison used helicopters to get towers and lines into remote areas of the national forest.

Jennifer Beeler
Green Valley Resident- La County
Po box 713, Leona valley CA 93551

Response 6-B: As described in Chapter 2 of the Final EIS/EIR, Alternative 2, the Proposed Action, would not result in the removal of any private residences with the implementation of the Three-Circuit Mitigation. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response 6-C: Alternative 1 is not identified as the Federal Agency Preferred or Environmentally Superior Alternative in the Final EIS/EIR because of overall higher impacts associated with this Alternative. A description of the rationale to select Alternative 2 as the Federal Agency Preferred and Environmentally Superior Alternative is found in the Final EIS/EIR in Sections 2.7 and 2.8. Documentation and comparison of the impacts of each of the Alternatives, including Alternative 1, are found in the Final EIS/EIR in Section 2.6.6 and Table 2-11.



7-A I Alison Bistline do not Support the
plan of the power lines being extended in GreenValley.
I have grown up to know this area as a
wonder to look at. The Scenery and as well as
the animals will be threatend. I belive that
It will make the area more city which people
come up here for the Scenery not to
see ugly power lines towering over our
7-B mountains. It will also i belive ruin the animal
population even more by scaring them off.
This is not a city its a small town
with beautiful Scenery stop trying to bring
city into my home town. I grew up
here and I dont want to see it get
ruined by metal.

– AlisonBistline

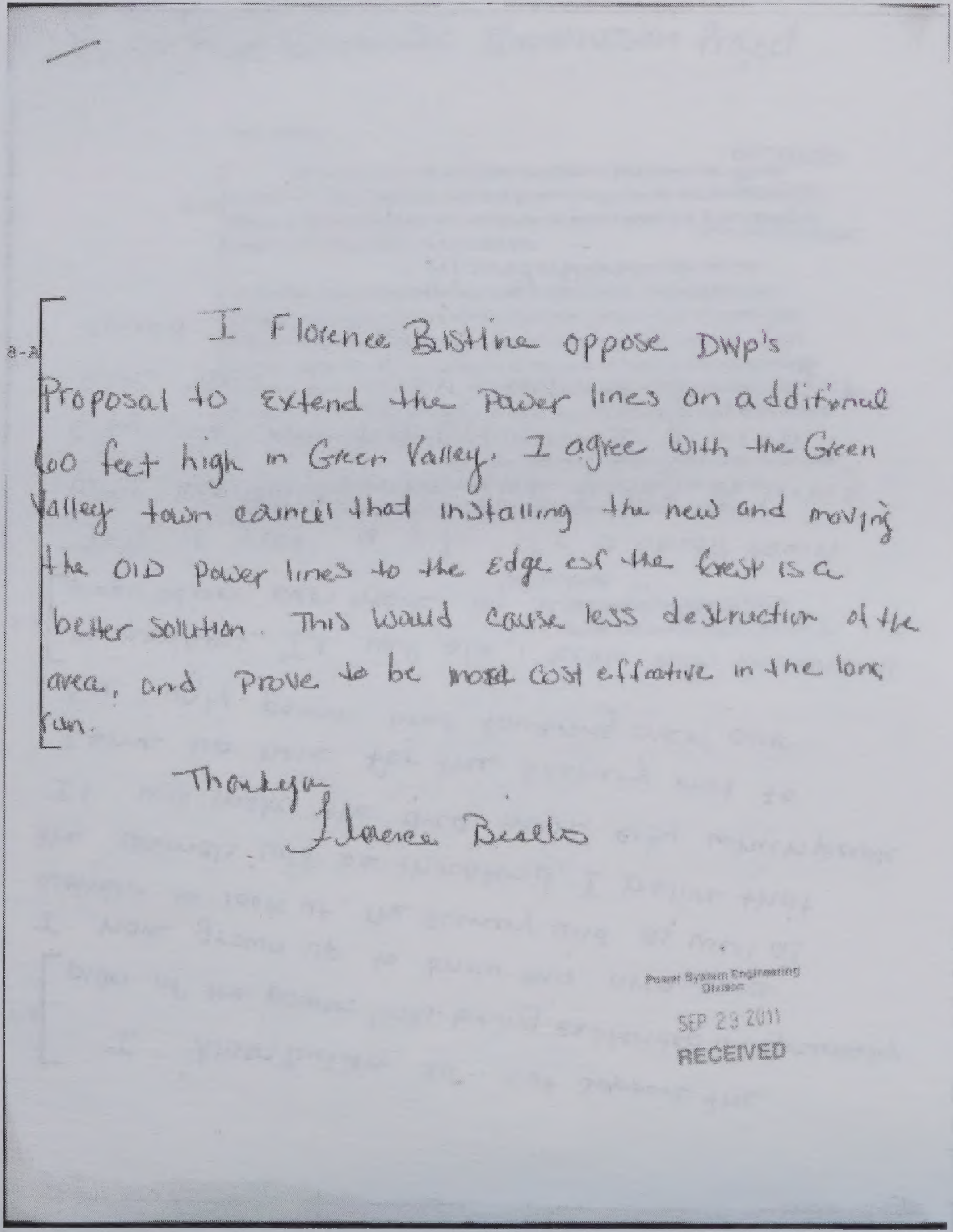
Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 7: BISTLINE, A.

Response 7-A: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response 7-B: Impacts to wildlife as a result of constructing and operating any of the Alternatives are examined in detail in the Final EIS/EIR in Section 4.3.1.

INDIVIDUAL COMMENT LETTER 8: BISTLINE, F.



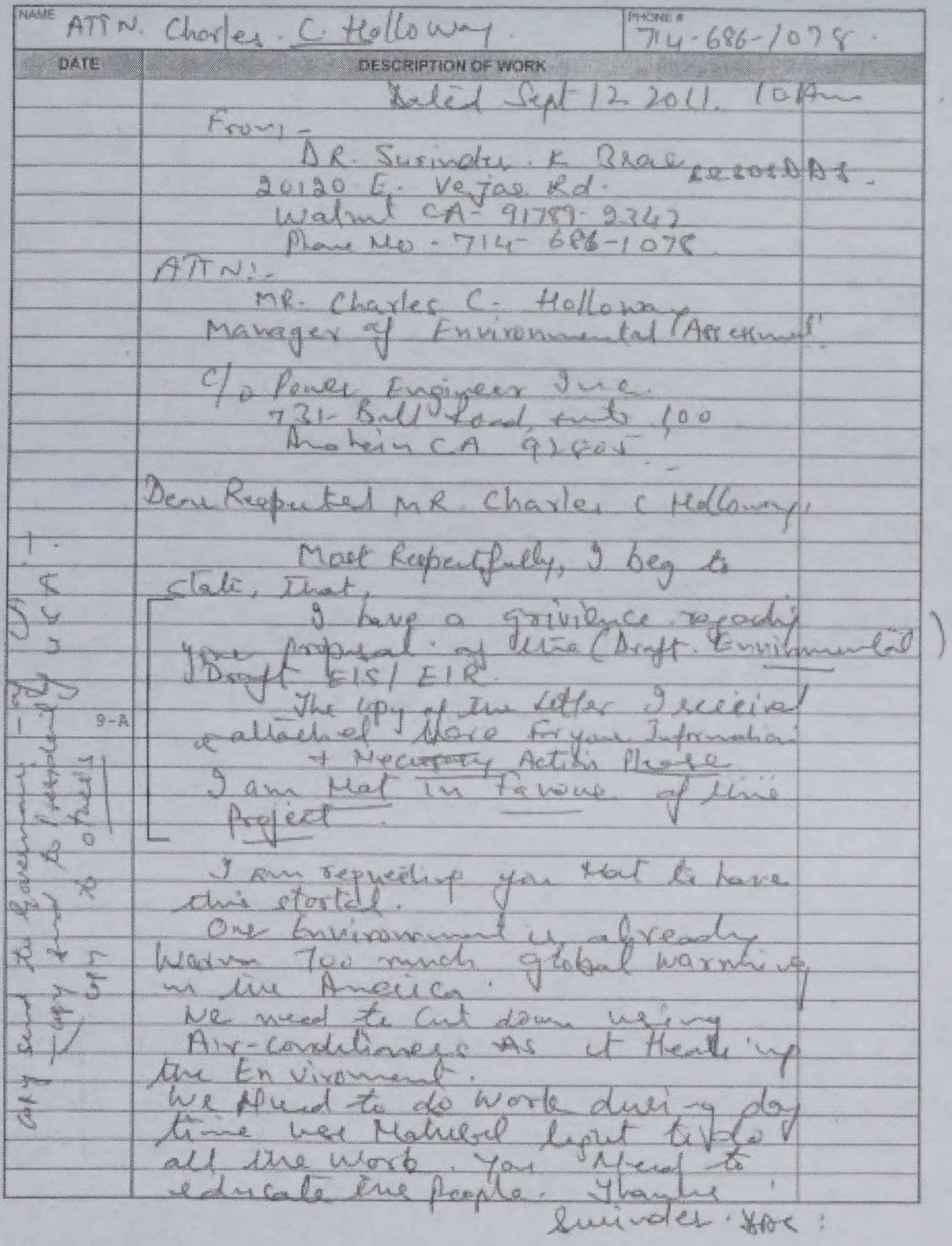
8-A I Florence Bistline oppose DWP's Proposal to Extend the Power lines on additional 60 feet high in Green Valley. I agree with the Green Valley town council that installing the new and moving the OlD power lines to the edge of the forest is a better solution. This would cause less destruction of the area, and Prove to be most cost effective in the long run.

Thankyou

Florence Bistline

Power System Engineering
Division
SEP 23 2011
RECEIVED

Response 8-A: Firefighting is a very important factor in the BRRTP environmental review process. Please refer to Section 3.2.11 and Section 4.2.11 of the Final EIS/EIR for a complete analysis of the fire risks associated with each Alternative. Also please refer to Response 2-A.



NAME ATTN. Charles. C Holloway. PHONE # 714-686-1078.

DATE | DESCRIPTION OF WORK

Dated Sept 12 2011. 10Am

From:-
DR. Surinder. K Brar [illegible]
20120 E. Vejar Rd.
Walnut CA- 91789-2342
Phone No - 714- 686-1078.

ATTN:-
MR. Charles C. Holloway
Manager of Environmental 'Assessment'

C/o Power Engineers Inc.
731- Bell Road, Suite 100
Anaheim CA 92805

Dear Respected MR. Charles C Holloway,

Most Respectfully, I beg to state, That,

9-A

I have a grievance regarding your proposal of this (Draft. Environmental) Draft EIS/EIR.

The copy of the letter I received attached Here For your Information + Necessary Action Please.

I am Not In Favour of this Project.

I am requesting you Not to have this started.

Our Environment is already Warm. Too much global warming in the America.

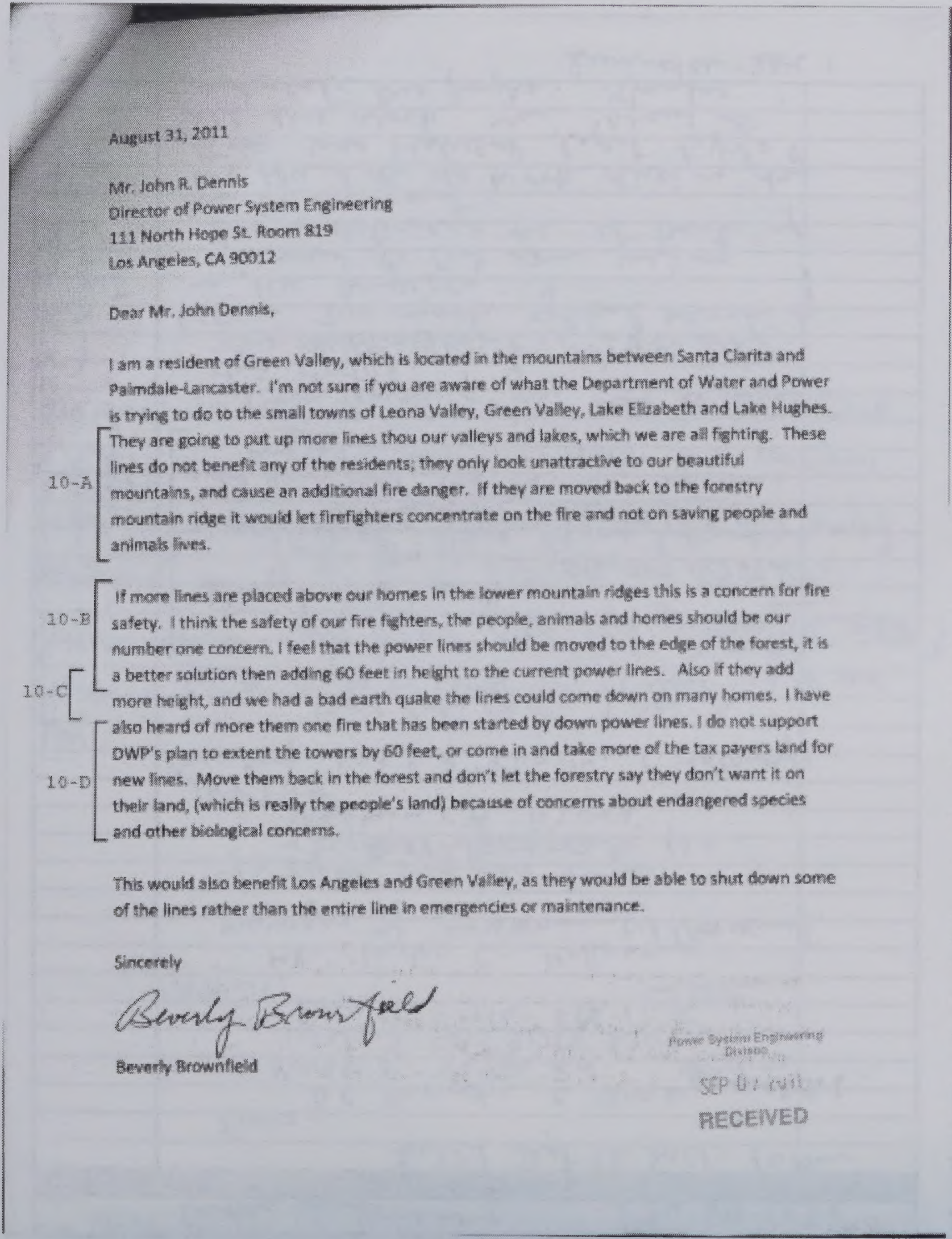
We need to Cut down using Air-conditioners As it Heats up the Environment.

We Need to do Work during day time use Natural light to do all the work. You Need to educate the people. Thanks

Surinder. Brar:

INDIVIDUAL COMMENT LETTER 9: BRAR, S.

Response 9-A: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



August 31, 2011

Mr. John R. Dennis
Director of Power System Engineering
111 North Hope St. Room 819
Los Angeles, CA 90012

Dear Mr. John Dennis,

I am a resident of Green Valley, which is located in the mountains between Santa Clarita and Palmdale-Lancaster. I'm not sure if you are aware of what the Department of Water and Power is trying to do to the small towns of Leona Valley, Green Valley, Lake Elizabeth and Lake Hughes. 10-A They are going to put up more lines thou our valleys and lakes, which we are all fighting. These lines do not benefit any of the residents; they only look unattractive to our beautiful mountains, and cause an additional fire danger. If they are moved back to the forestry mountain ridge it would let firefighters concentrate on the fire and not on saving people and animals lives.

10-B If more lines are placed above our homes in the lower mountain ridges this is a concern for fire safety. I think the safety of our fire fighters, the people, animals and homes should be our number one concern. I feel that the power lines should be moved to the edge of the forest, it is a better solution then adding 60 feet in height to the current power lines. 10-C Also if they add more height, and we had a bad earth quake the lines could come down on many homes. 10-D I have also heard of more them one fire that has been started by down power lines. I do not support DWP's plan to extent the towers by 60 feet, or come in and take more of the tax payers land for new lines. Move them back in the forest and don't let the forestry say they don't want it on their land, (which is really the people's land) because of concerns about endangered species and other biological concerns.

This would also benefit Los Angeles and Green Valley, as they would be able to shut down some of the lines rather than the entire line in emergencies or maintenance.

Sincerely

Beverly Brownfield

Beverly Brownfield

Power System Engineering
Division
SEP 07 2011
RECEIVED

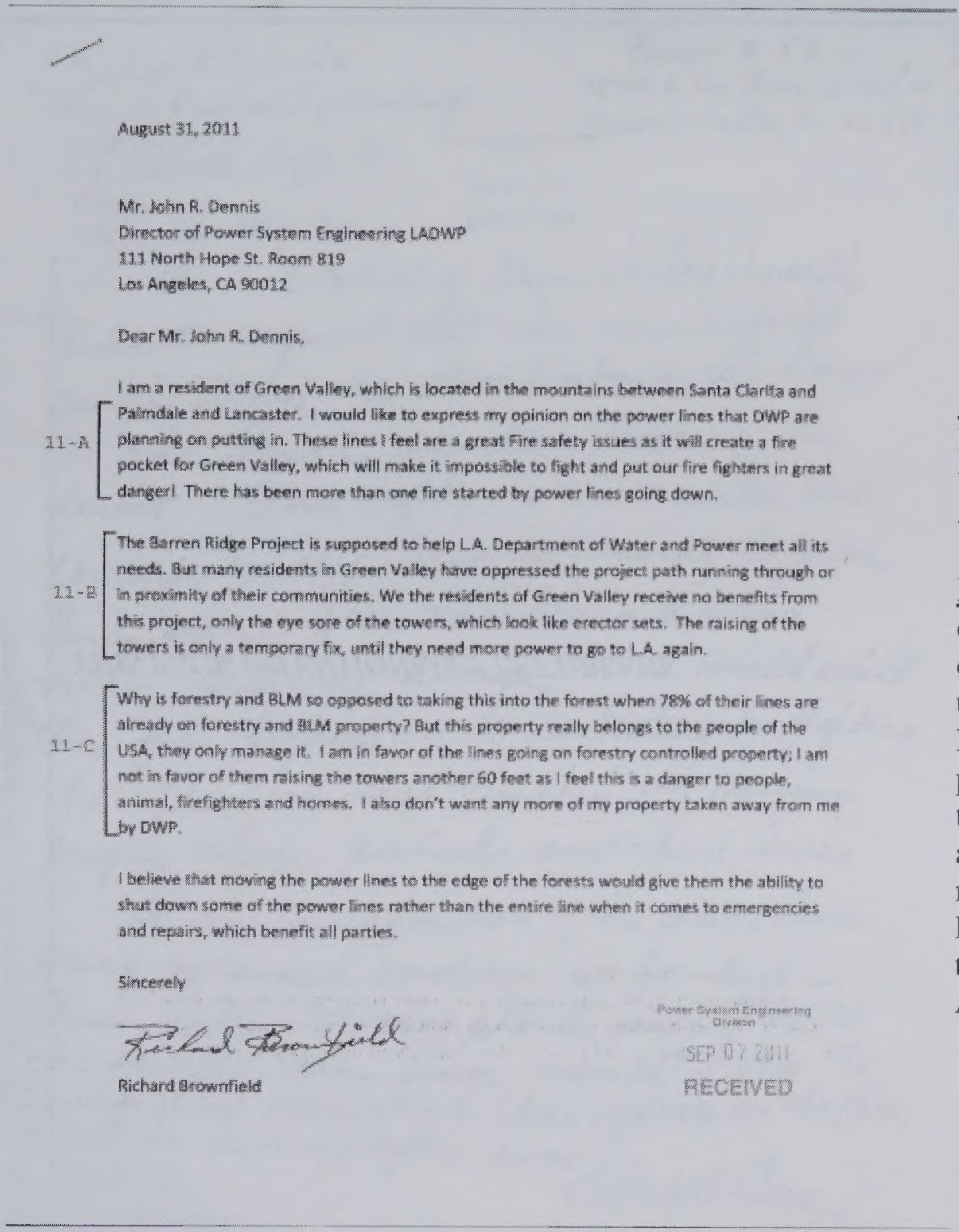
INDIVIDUAL COMMENT LETTER 10: BROWNFIELD, B.

Response 10-A: Firefighting is a very important factor in the BRRTP environmental review process. Please refer to Section 3.2.11 and Section 4.2.11 of the Final EIS/EIR for a complete analysis of the fire risks associated with each Alternative. Also please refer to Response 2-A.

Response 10-B: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the taller towers, as proposed. Please also refer to Section 4.2.11 of the Final EIS/EIR for a detailed analysis of the firefighting risks associated with the Alternatives.

Response 10-C: The design and engineering of the transmission towers would make it very unlikely they would fall. Additionally, fall distance to homes was considered during the development of the Alternatives and in determining the width of the right-of-way. This line will be designed so as to avoid falling onto homes even in earthquakes or other upset conditions, so there would be a very low risk.

Response 10-D: Please refer to Response 2-A relating to moving of the designated corridor, the BRRTP, and the existing lines to the top of the mountain to the west of Green Valley. Firefighting would not be significantly affected by the Proposed Action's taller towers. Please refer to Section 4.2.11 of the Final EIS/EIR for detailed analysis and information.



August 31, 2011

Mr. John R. Dennis
Director of Power System Engineering LADWP
111 North Hope St. Room 819
Los Angeles, CA 90012

Dear Mr. John R. Dennis,

11-A I am a resident of Green Valley, which is located in the mountains between Santa Clarita and Palmdale and Lancaster. I would like to express my opinion on the power lines that DWP are planning on putting in. These lines I feel are a great Fire safety issues as it will create a fire pocket for Green Valley, which will make it impossible to fight and put our fire fighters in great danger! There has been more than one fire started by power lines going down.

11-B The Barren Ridge Project is supposed to help L.A. Department of Water and Power meet all its needs. But many residents in Green Valley have oppressed the project path running through or in proximity of their communities. We the residents of Green Valley receive no benefits from this project, only the eye sore of the towers, which look like erector sets. The raising of the towers is only a temporary fix, until they need more power to go to L.A. again.

11-C Why is forestry and BLM so opposed to taking this into the forest when 78% of their lines are already on forestry and BLM property? But this property really belongs to the people of the USA, they only manage it. I am in favor of the lines going on forestry controlled property; I am not in favor of them raising the towers another 60 feet as I feel this is a danger to people, animal, firefighters and homes. I also don't want any more of my property taken away from me by DWP.

I believe that moving the power lines to the edge of the forests would give them the ability to shut down some of the power lines rather than the entire line when it comes to emergencies and repairs, which benefit all parties.

Sincerely

Richard Brownfield

Richard Brownfield

Power System Engineering
Division
SEP 07 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 11: BROWNFIELD, R.

Response 11-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the taller towers, as proposed. Please also refer to Section 4.2.11 of the Final EIS/EIR for a detailed analysis of the firefighting risks associated with the Alternatives. Also please refer to Response 2-A.

Response 11-B: While we agree that the primary benefit of the Project is to bring renewable energy to the City of Los Angeles, the addition of the BRRTP makes renewable energy more available to the public and, as such, is a benefit to the region.

Response 11-C: BLM and the Angeles National Forest are not opposed to the line being routed on National Forest System lands or on public lands managed by the BLM. The designated corridor that is the proposed location for the BRRTP was established on the National Forest in suitable locations. Although the acquisition of private property in the Green Valley area would not be necessary to implement the Proposed Action, it would not be possible to avoid siting the line on private lands in all areas because of the mixed land jurisdiction configuration in this part of California. Firefighting would not be significantly affected by the taller towers, as proposed (refer to Section 4.2.11 of the Draft EIS/EIR). Also please refer to Response 2-A.

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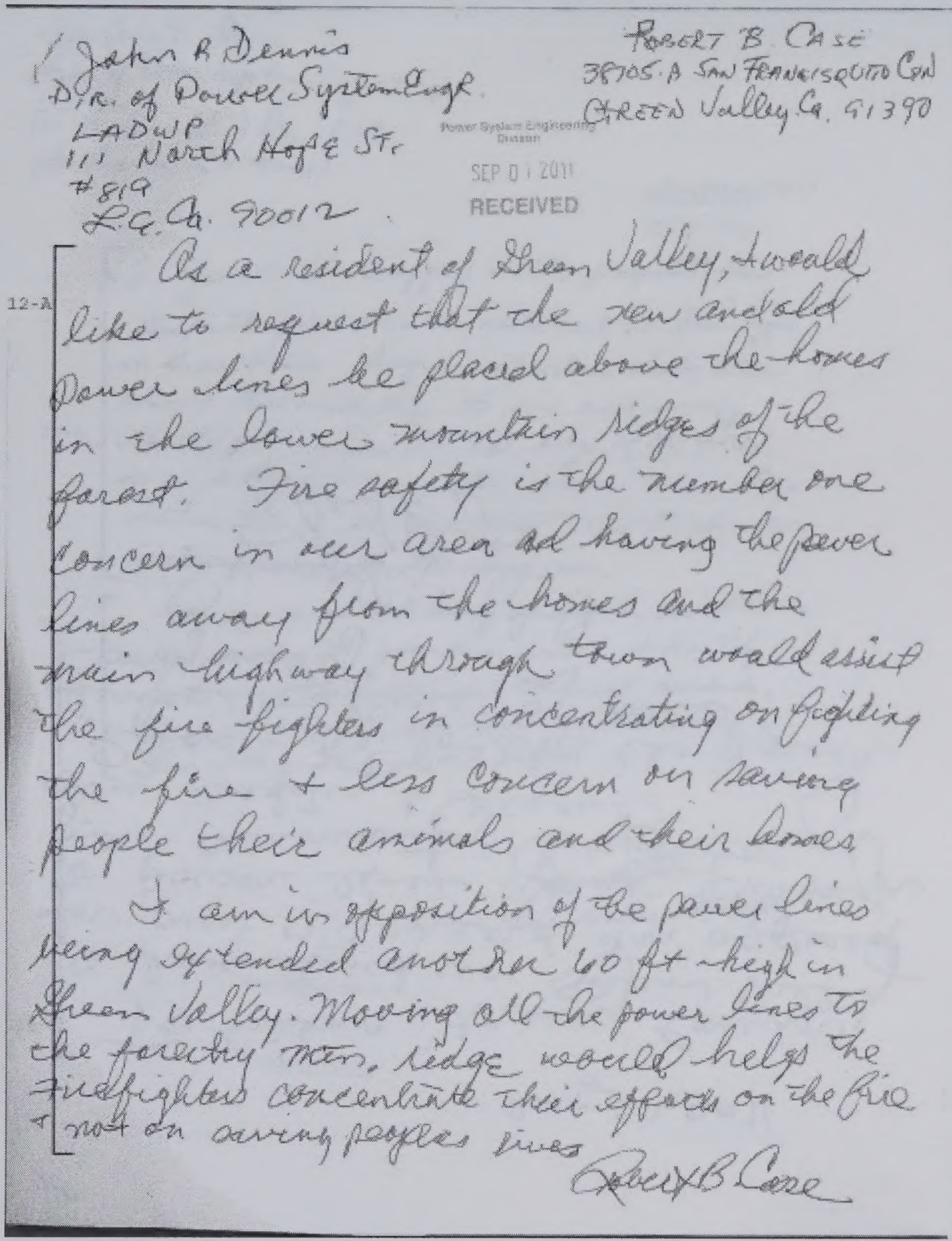


ROBERT B. CASE
38705-A SAN FRANCISQUITO CYN
GREEN Valley Ca. 91390

John R Dennis
DIR. of Power System Engr.
LADWP
111 North Hope Str.
#819
L.A. Ca. 90012

Power System Engineering Division
SEP 01 2011
RECEIVED

12-A As a resident of Green Valley, I would like to request that the new and old power lines be placed above the homes in the lower mountain ridges of the forest. Fire safety is the number one concern in our area ad having the power lines away from the homes and the main highway through town would assist the fire fighters in concentrating on fighting the fire + less concern on saving people their animals and their homes

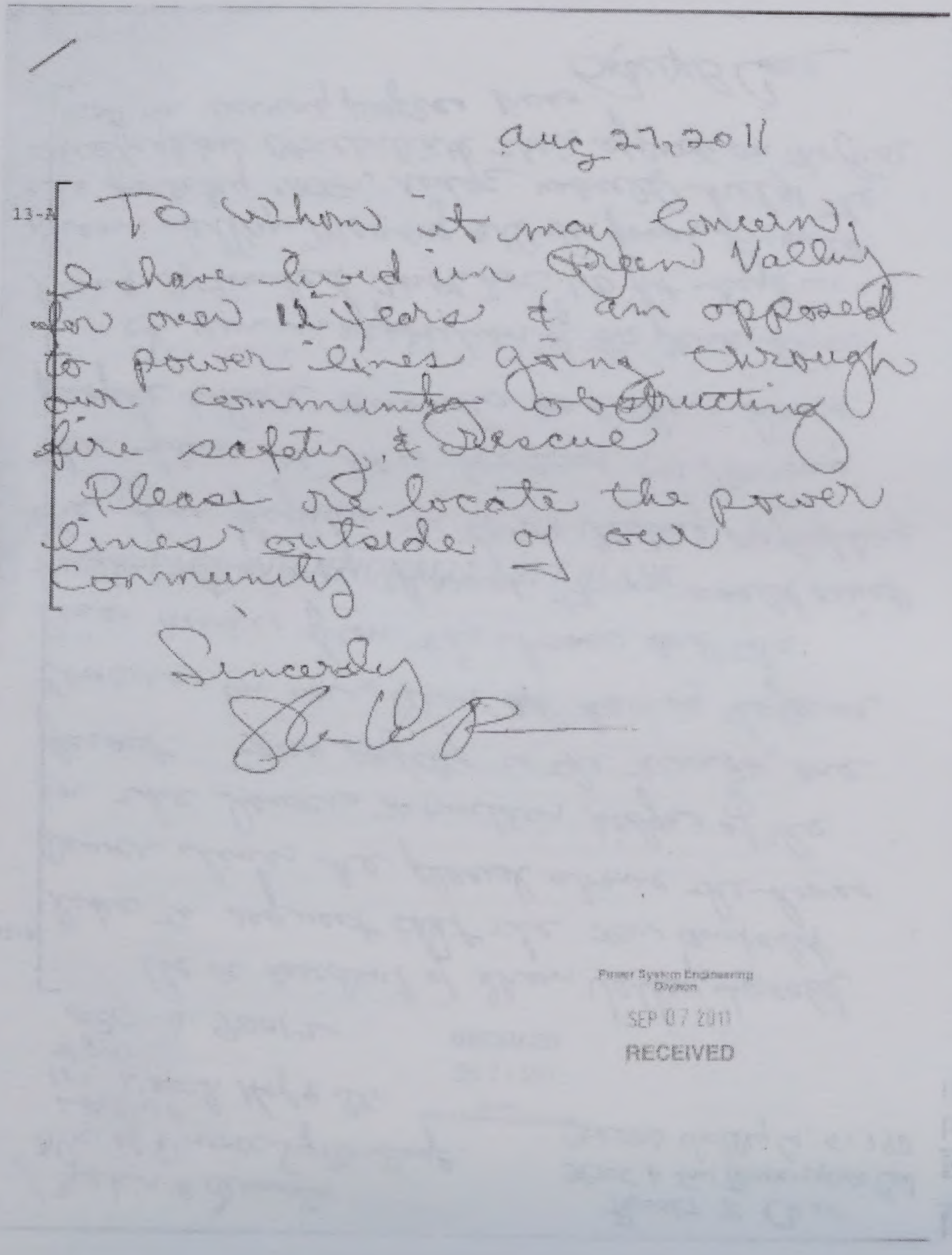
I am in opposition of the power lines being extended another 60 ft high in Green Valley. Moving all the power lines to the forestry mtn. ridge would helps the firefighters concentrate their efforts on the fire + not on saving peoples lives

Robert B Case

INDIVIDUAL COMMENT LETTER 12: CASE, R.B.

Response 12-A: Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 13



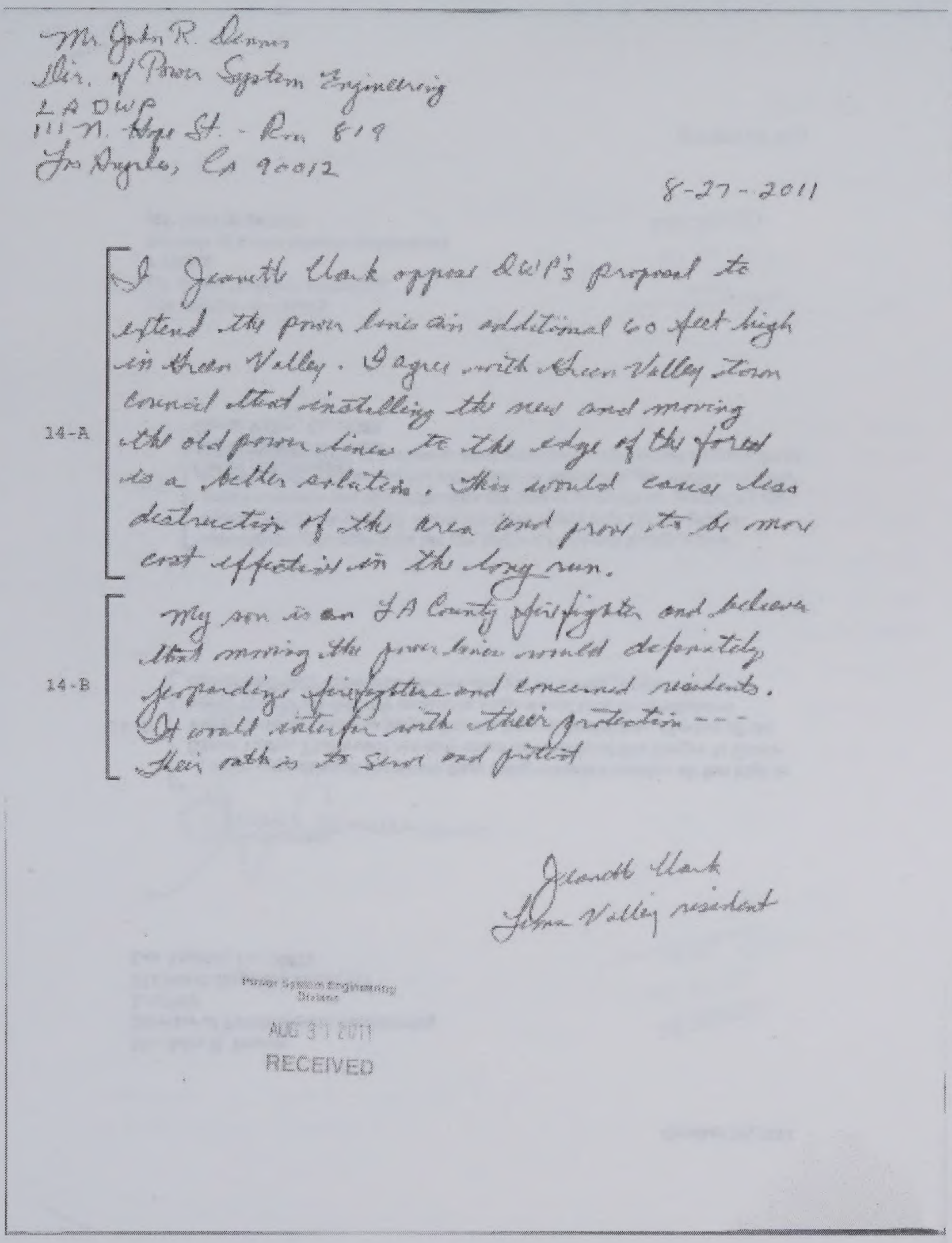
Aug 27, 2011

13-A To Whom it may Concern,
I have lived in Green Valley for over 12 years & am opposed to power lines going through our community obstructing fire safety, & Rescue
Please re locate the power lines outside of our Community

Sincerely

Power System Engineering Division
SEP 07 2011
RECEIVED

Response 13-A: Please refer to Response 2-A.



Mr. John R. Dennis
Dir. of Power System Engineering
LADWP
111 N. Hope St. - Rm 819
Los Angeles, CA 90012

8-27-2011

14-A I Jeanette Clark oppose DWP's proposal to extend the power lines an additional 60 feet high in Green Valley. I agree with Green Valley Town Council that installing the new and moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective in the long run.

14-B My son is an LA County firefighter and believe that moving the power lines would definitely jeopardize firefighters and concerned residents. It would interfere with their protection --- their oath is to serve and protect

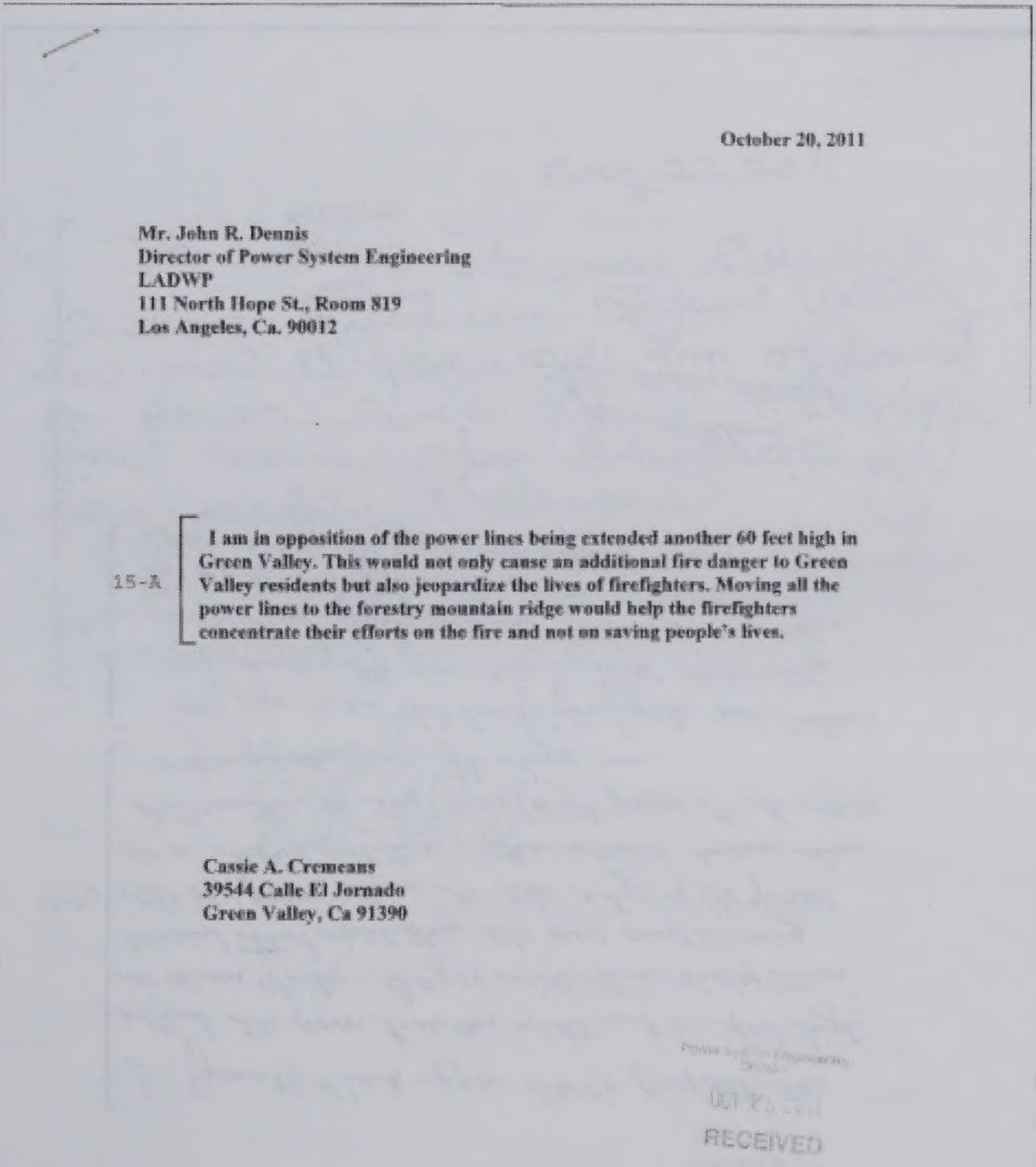
Jeanette Clark
Green Valley resident

Power System Engineering
Division
AUG 31 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 14: CLARK, J.

Response 14-A: Please refer to Response 2-A.

Response 14-B: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR).



October 20, 2011

Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St., Room 819
Los Angeles, Ca. 90012

15-A I am in opposition of the power lines being extended another 60 feet high in Green Valley. This would not only cause an additional fire danger to Green Valley residents but also jeopardize the lives of firefighters. Moving all the power lines to the forestry mountain ridge would help the firefighters concentrate their efforts on the fire and not on saving people's lives.

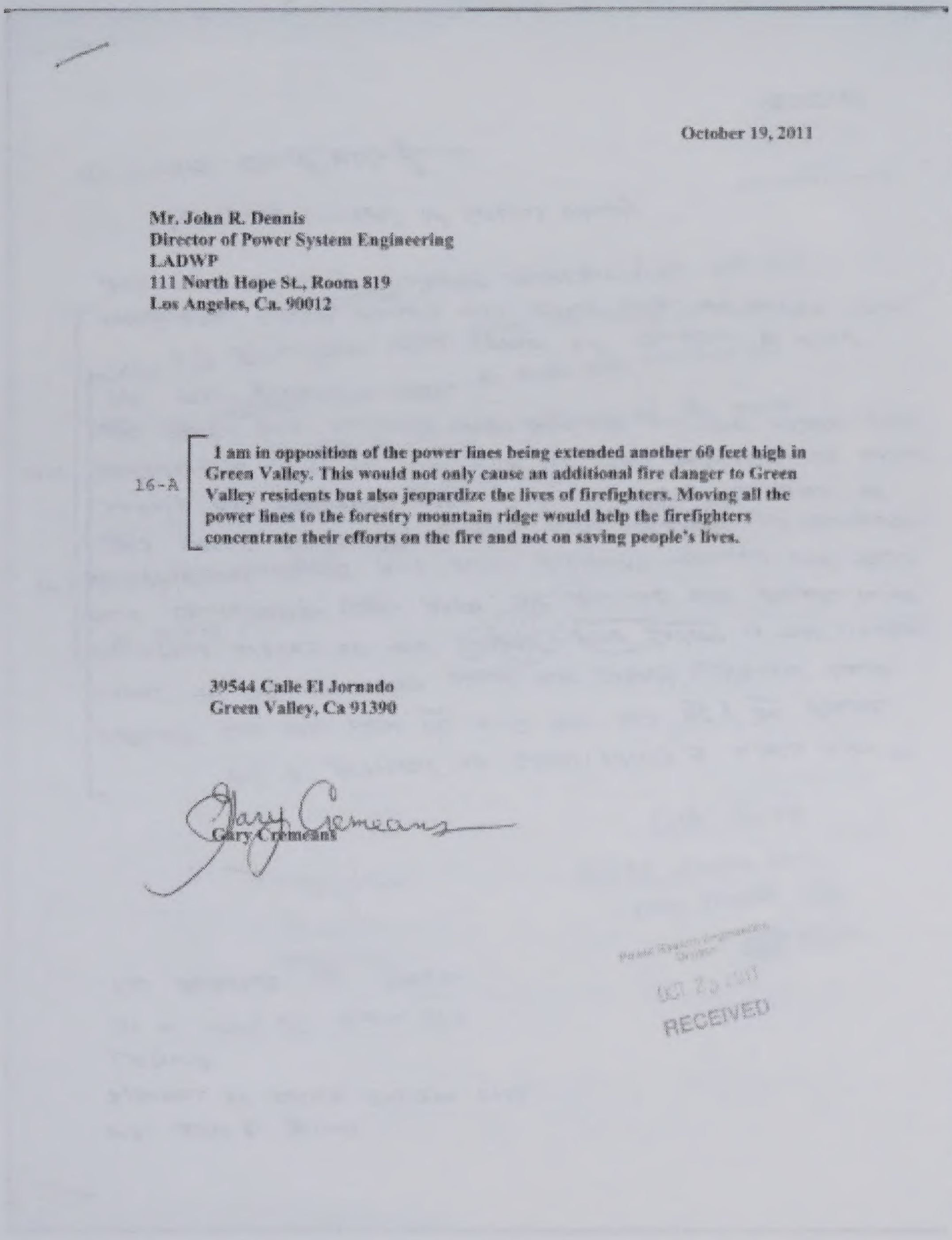
Cassie A. Cremeans
39544 Calle El Jornado
Green Valley, Ca 91390

Power System Engineering
Division
RECEIVED

INDIVIDUAL COMMENT LETTER 15: CREMEANS, C.

Response 15-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 16: CREMEANS, G.



October 19, 2011

Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St., Room 819
Los Angeles, Ca. 90012

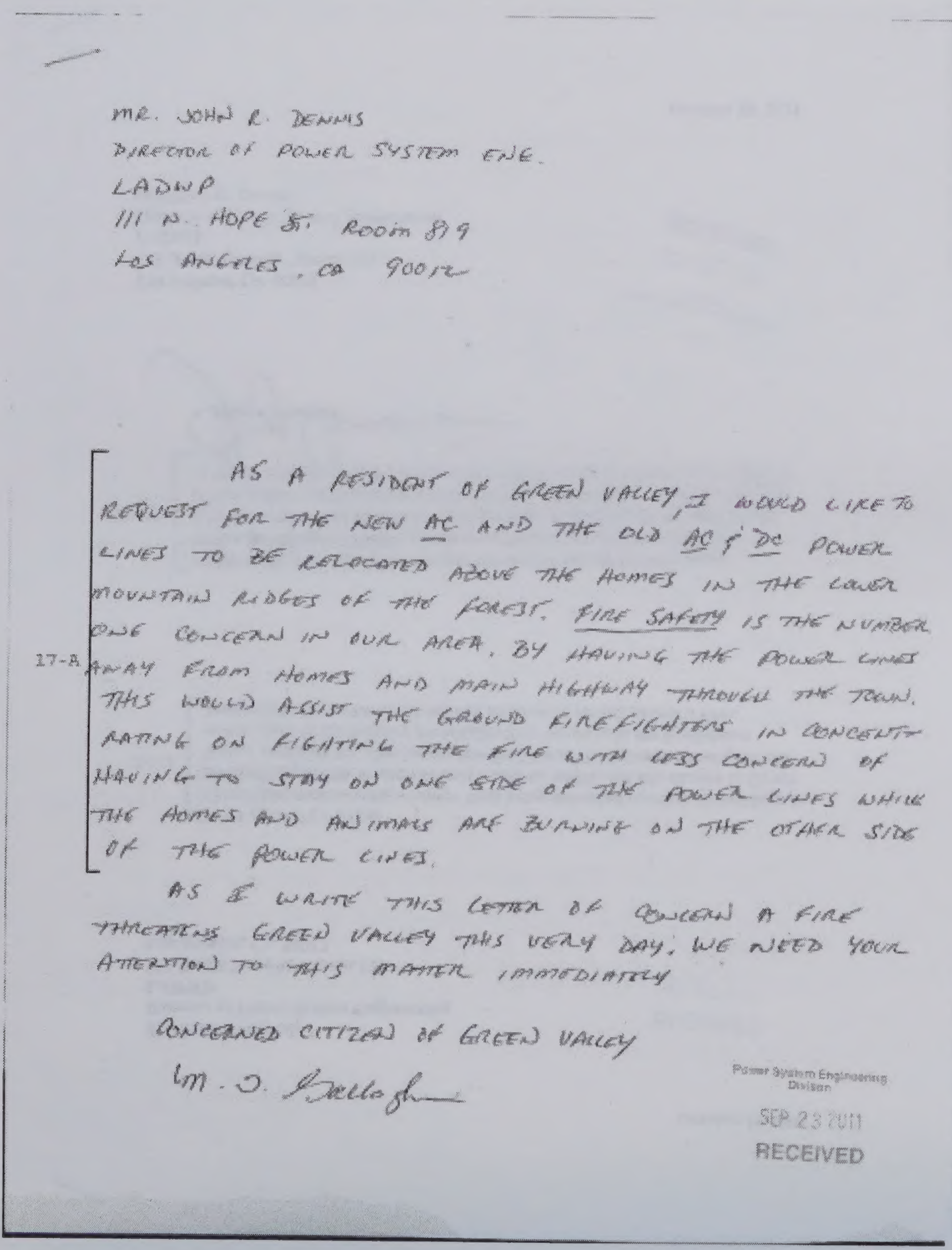
16-A I am in opposition of the power lines being extended another 60 feet high in Green Valley. This would not only cause an additional fire danger to Green Valley residents but also jeopardize the lives of firefighters. Moving all the power lines to the forestry mountain ridge would help the firefighters concentrate their efforts on the fire and not on saving people's lives.

39544 Calle El Jornado
Green Valley, Ca 91390

Gary Cremeans
Gary Cremeans

Power System Engineering Division
OCT 25 2011
RECEIVED

Response 16-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



MR. JOHN R. DENNIS
DIRECTOR OF POWER SYSTEM ENG.
LADWP
111 N. HOPE ST. ROOM 819
LOS ANGELES, CA 90012

17-A AS A RESIDENT OF GREEN VALLEY, I WOULD LIKE TO REQUEST FOR THE NEW AC AND THE OLD AC & DC POWER LINES TO BE RELOCATED ABOVE THE HOMES IN THE LOWER MOUNTAIN RIDGES OF THE FOREST. FIRE SAFETY IS THE NUMBER ONE CONCERN IN OUR AREA. BY HAVING THE POWER LINES AWAY FROM HOMES AND MAIN HIGHWAY THROUGH THE TOWN. THIS WOULD ASSIST THE GROUND FIREFIGHTERS IN CONCENTRATING ON FIGHTING THE FIRE WITH LESS CONCERN OF HAVING TO STAY ON ONE SIDE OF THE POWER LINES WHILE THE HOMES AND ANIMALS ARE BURNING ON THE OTHER SIDE OF THE POWER LINES.

AS I WRITE THIS LETTER OF CONCERN A FIRE THREATENS GREEN VALLEY THIS VERY DAY, WE NEED YOUR ATTENTION TO THIS MATTER IMMEDIATELY

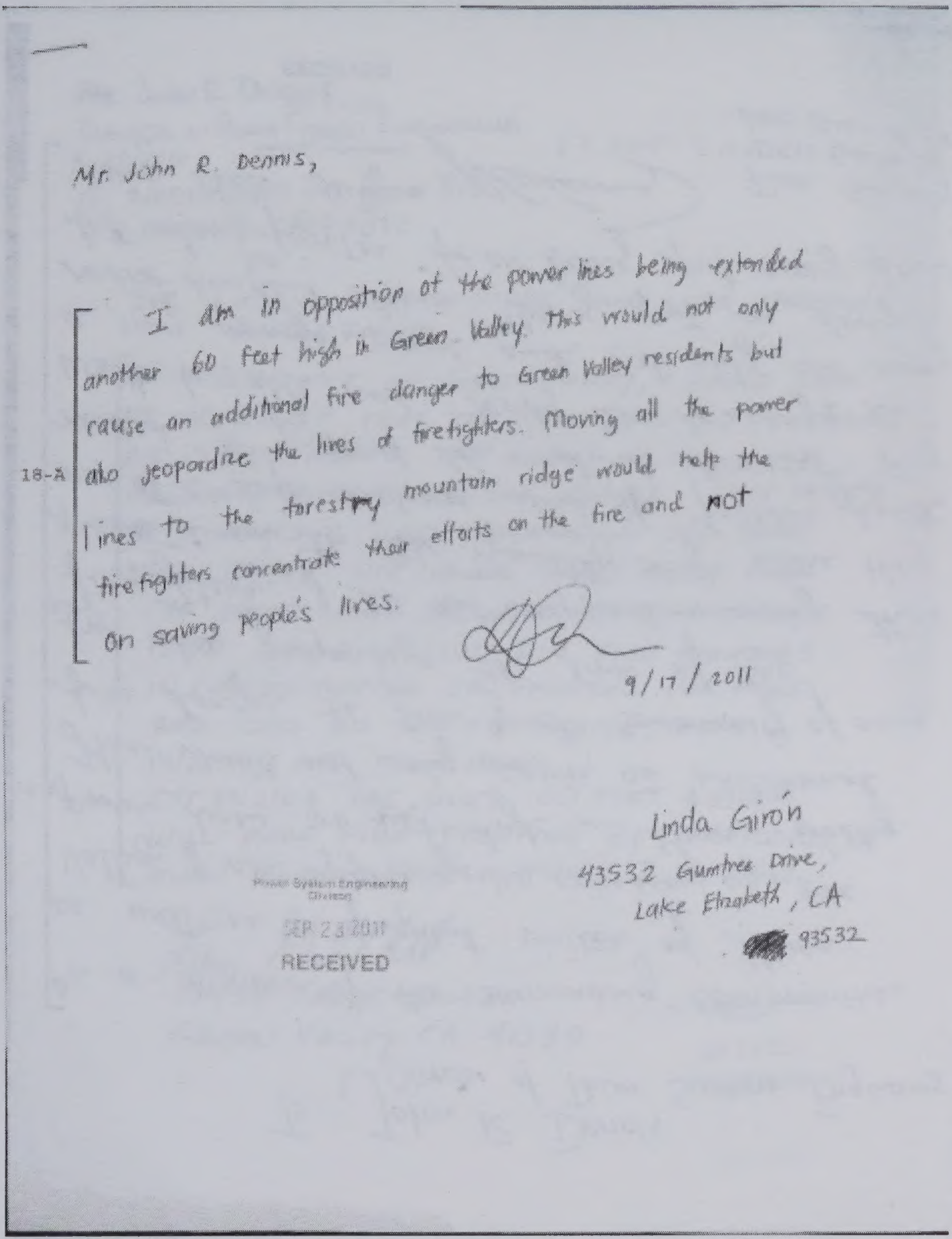
CONCERNED CITIZEN OF GREEN VALLEY

M. D. Gallagher

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 17: GALLAGHER, M.D.

Response 17-A: Please refer to Response 2-A. Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR).



Mr. John R. Dennis,

18-A I am in opposition of the power lines being extended another 60 feet high in Green Valley. This would not only cause an additional fire danger to Green Valley residents but also jeopardize the lives of firefighters. Moving all the power lines to the forestry mountain ridge would help the firefighters concentrate their efforts on the fire and not on saving people's lives.

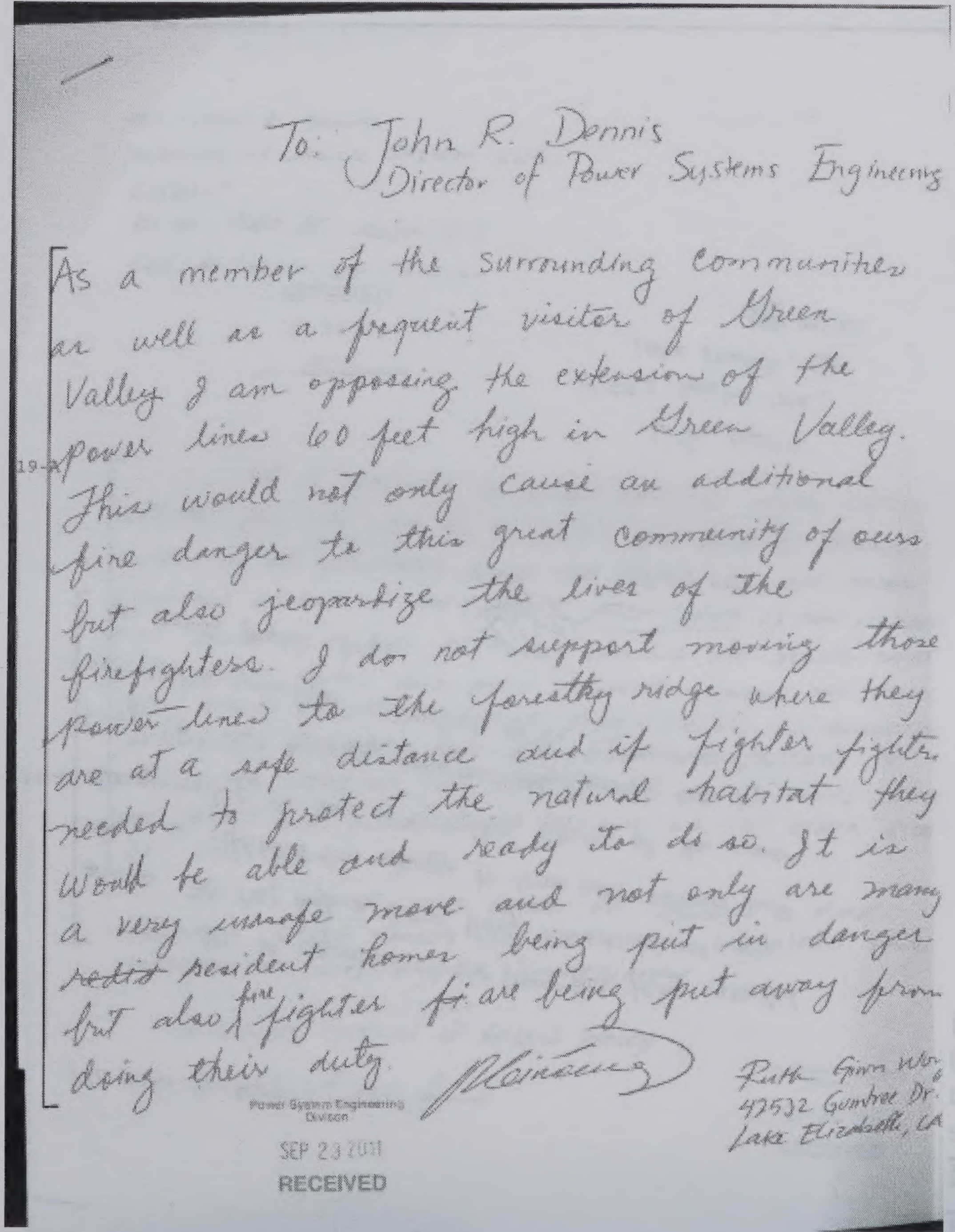
9/17/2011

Linda Girón
43532 Gumtree Drive,
Lake Elizabeth, CA
93532

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 18: GIRON, L.

Response 18-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



To: John R. Dennis
Director of Power Systems Engineering

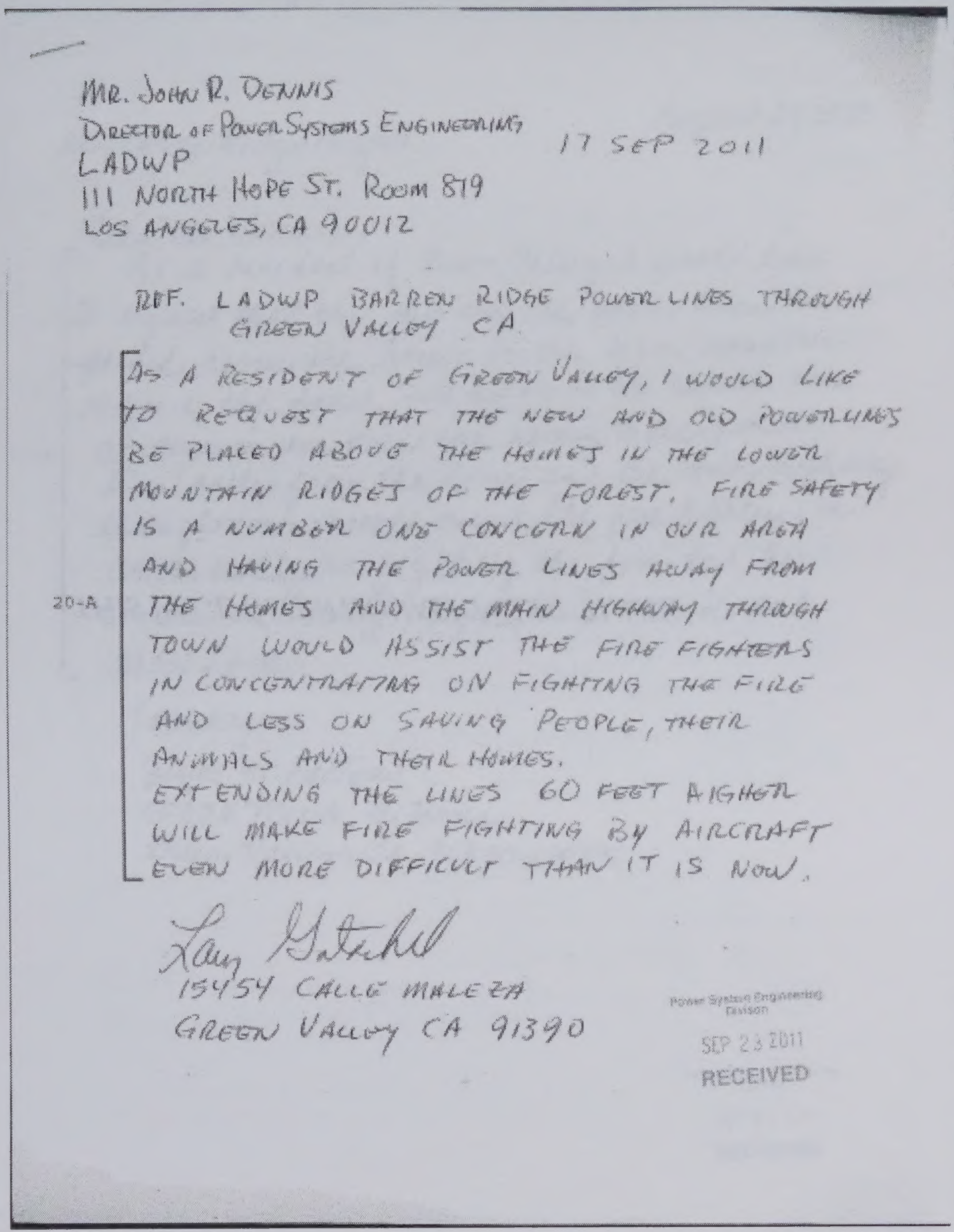
19-A As a member of the surrounding communities as well as a frequent visitor of Green Valley I am opposing the extension of the power lines 60 feet high in Green Valley. This would not only cause an additional fire danger to this great community of ours but also jeopardize the lives of the firefighters. I do not support moving those power lines to the forestry ridge where they are at a safe distance and if fighter fighters needed to protect the natural habitat they Would be able and ready to do so. It is a very unsafe move and not only are many ~~redid~~ resident homes being put in danger but also fire fighter fi are being put away from doing their duty.

Ruth Giron Wo
42532 Gumtree Dr.
Lake Elizabeth, CA

Power System Engineering
Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 19: GIRON, R.

Response 19-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



MR. JOHN R. DENNIS
DIRECTOR OF POWER SYSTEMS ENGINEERING
LADWP
111 NORTH HOPE ST. ROOM 879
LOS ANGELES, CA 90012

17 SEP 2011

REF. LADWP BARREN RIDGE POWER LINES THROUGH GREEN VALLEY CA

20-A AS A RESIDENT OF GREEN VALLEY, I WOULD LIKE TO REQUEST THAT THE NEW AND OLD POWERLINES BE PLACED ABOVE THE HOMES IN THE LOWER MOUNTAIN RIDGES OF THE FOREST. FIRE SAFETY IS A NUMBER ONE CONCERN IN OUR AREA AND HAVING THE POWER LINES AWAY FROM THE HOMES AND THE MAIN HIGHWAY THROUGH TOWN WOULD ASSIST THE FIRE FIGHTERS IN CONCENTRATING ON FIGHTING THE FIRE AND LESS ON SAVING PEOPLE, THEIR ANIMALS AND THEIR HOMES.
EXTENDING THE LINES 60 FEET HIGHER WILL MAKE FIRE FIGHTING BY AIRCRAFT EVEN MORE DIFFICULT THAN IT IS NOW.

Larry Goetschel
15454 CALLE MALEZA
GREEN VALLEY CA 91390

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 20: GOETSCHEL, L.

Response 20-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

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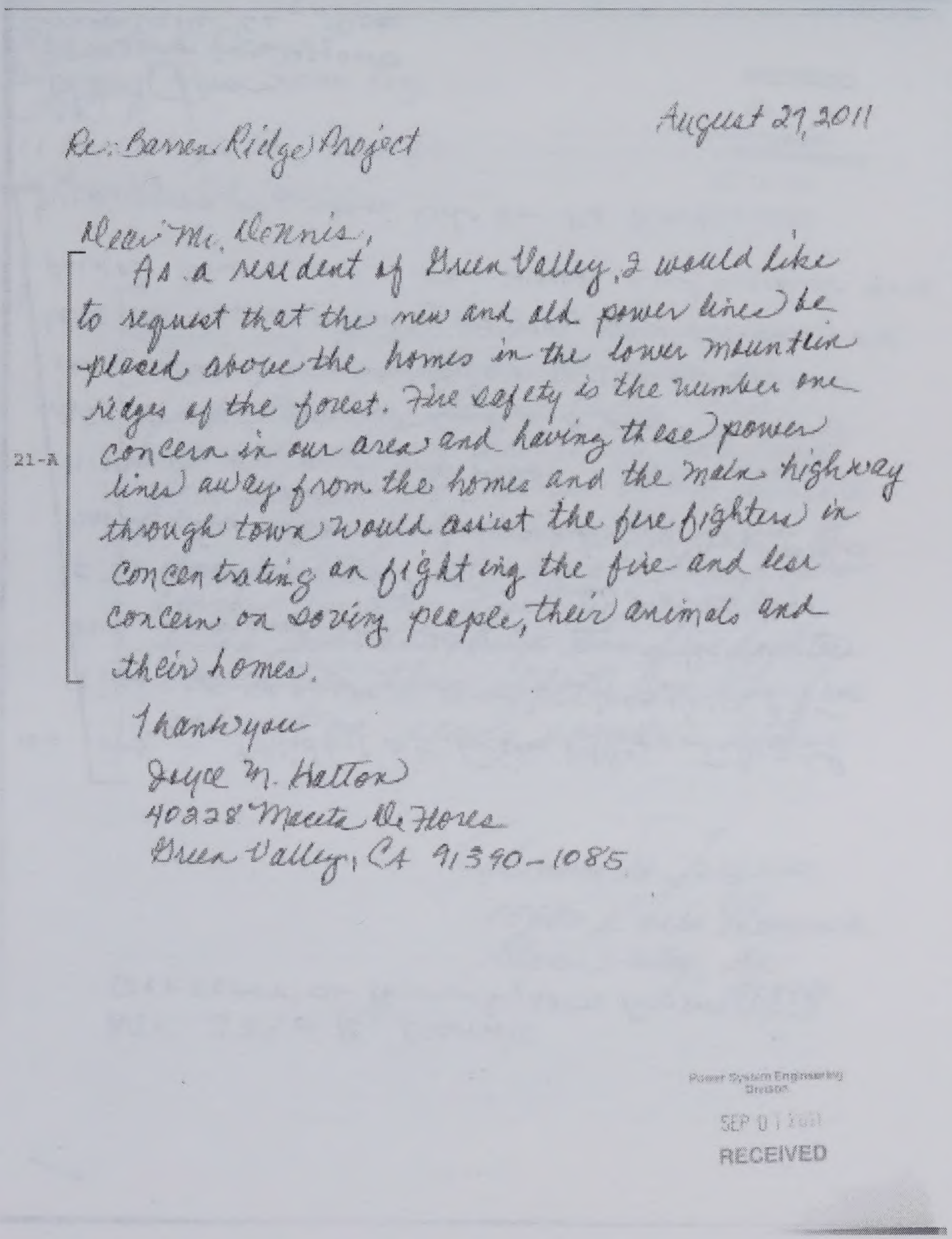


August 27, 2011

Re: Barren Ridge Project

Dear Mr. Dennis,

21-A As a resident of Green Valley, I would like to request that the new and old power lines be placed above the homes in the lower mountain ridges of the forest. Fire safety is the number one concern in our area and having these power lines away from the homes and the main highway through town would assist the fire fighters in concentrating an fighting the fire and less concern on saving people, their animals and their homes.

Thank you
Joyce M. Hatton
40228 Mecita De Flores
Green Valley, CA 91390-1085

Power System Engineering
Division

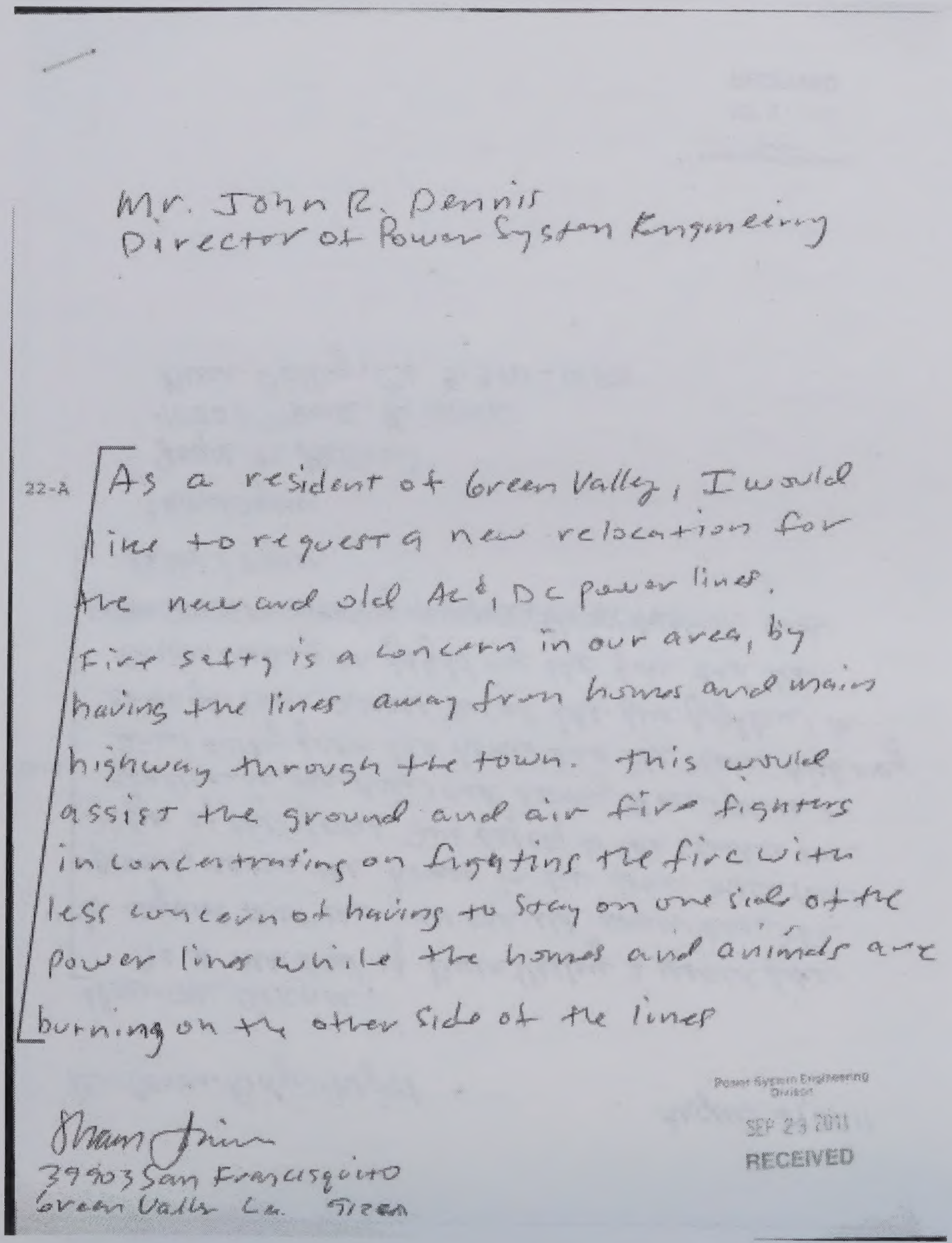
SEP 01 2011

RECEIVED

INDIVIDUAL COMMENT LETTER 21: HATTON, J.

Response 21-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 22: IRWIN, S.



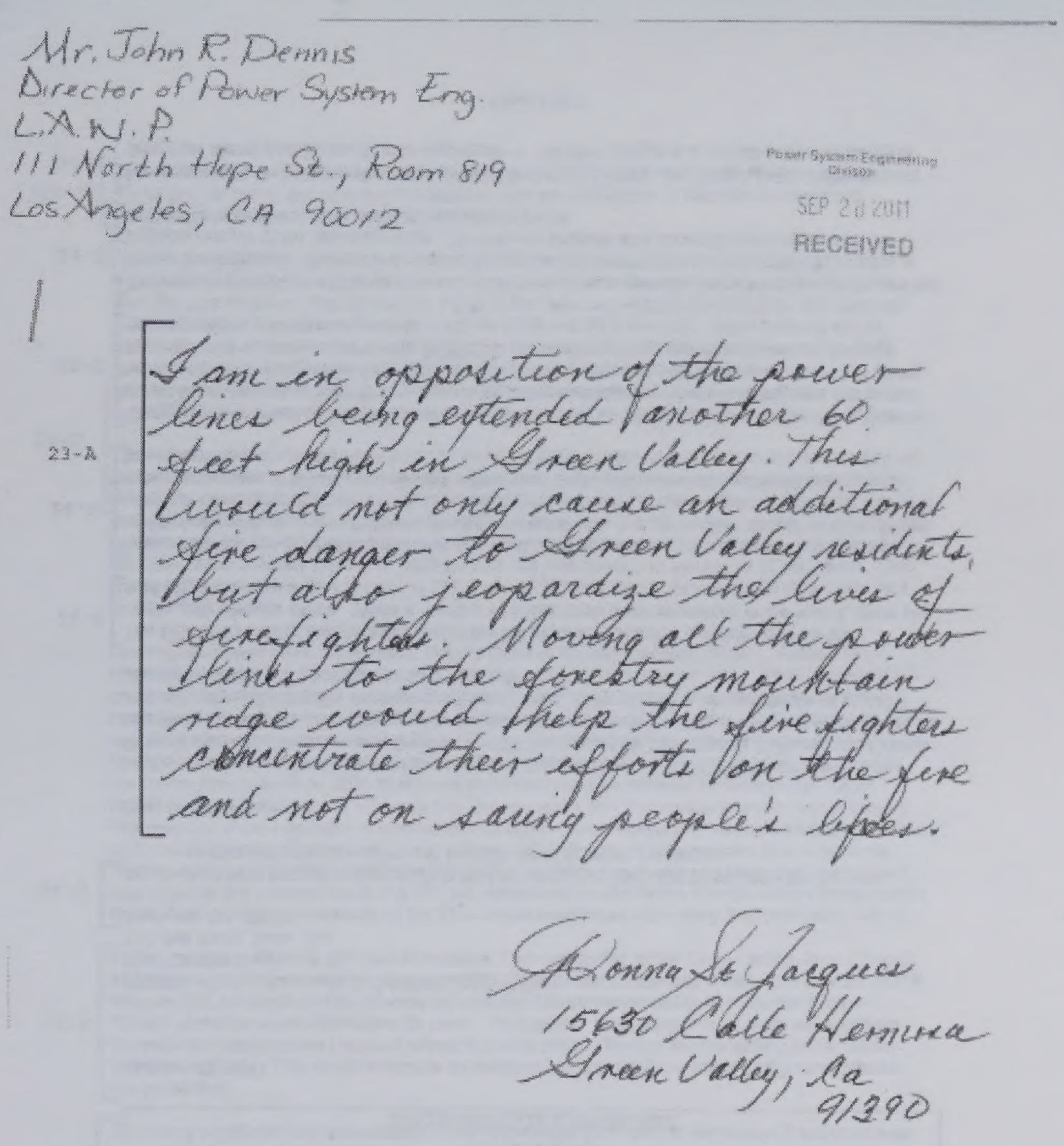
Mr. John R. Dennis
Director of Power System Engineering

22-A As a resident of Green Valley, I would like to request a new relocation for the new and old AC & DC power lines. Fire sefty is a concern in our area, by having the lines away from homes and main highway through the town. this would assist the ground and air fire fighters in concentrating on fighting the fire with less concern of having to stay on one side of the power lines while the homes and animals are burning on the other side of the lines

Sharon Irwin
39903 San Francisquito
Green Valley Ca. 91390

Power System Engineering
Division
SEP 23 2011
RECEIVED

Response 22-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



Mr. John R. Dennis
Director of Power System Eng.
L.A.W.P.
111 North Hope St., Room 819
Los Angeles, CA 90012

Power System Engineering Division
SEP 28 2011
RECEIVED

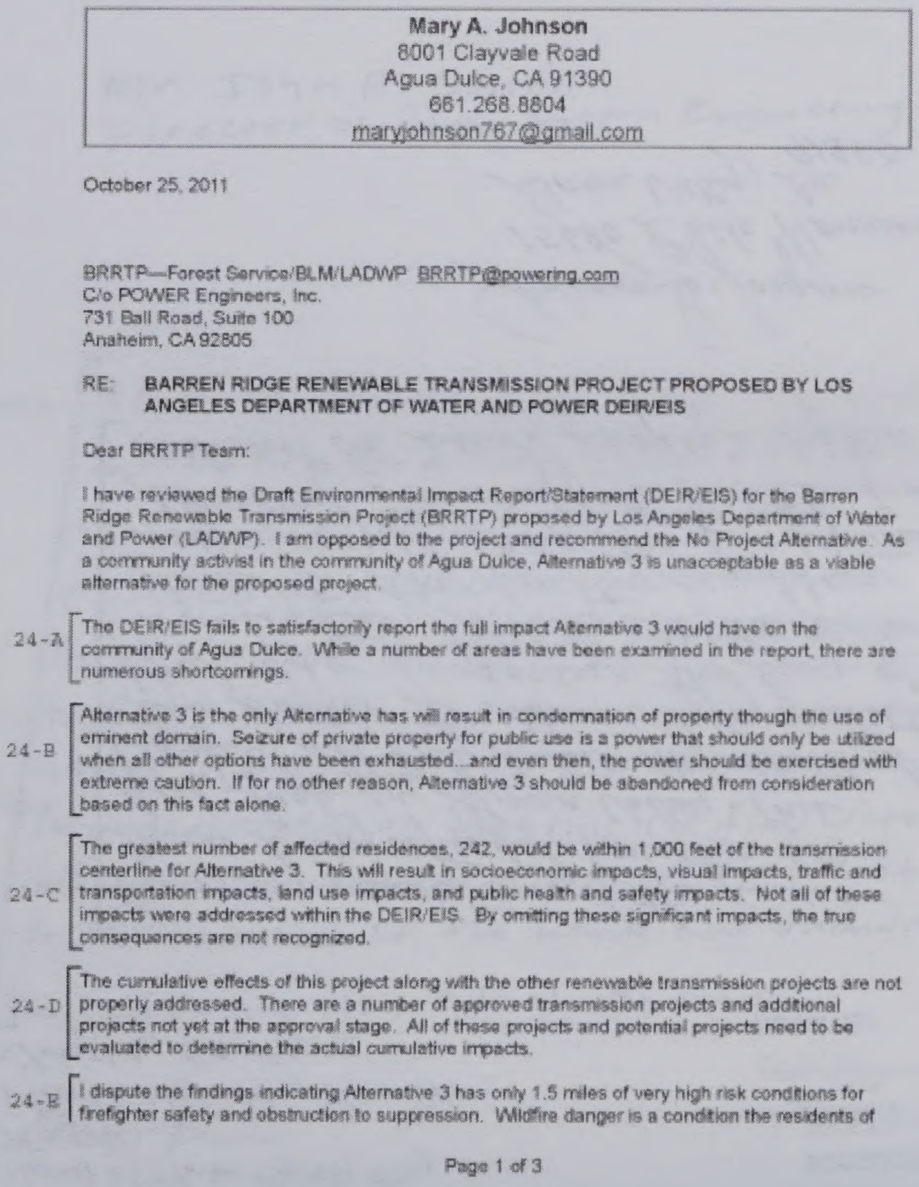
23-A I am in opposition of the power lines being extended another 60 feet high in Green Valley. This would not only cause an additional fire danger to Green Valley residents, but also jeopardize the lives of firefighters. Moving all the power lines to the forestry mountain ridge would help the fire fighters concentrate their efforts on the fire and not on saving people's lives.

Donna St Jacques
15630 Calle Hermosa
Green Valley, Ca
91390

INDIVIDUAL COMMENT LETTER 23: ST. JACQUES, D.

Response 23-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 24: JOHNSON, M.



Mary A. Johnson
8001 Clayvale Road
Agua Dulce, CA 91390
661.268.8804
maryjohnson767@gmail.com

October 25, 2011

BRRTP—Forest Service/BLM/LADWP BRRTP@powering.com
C/o POWER Engineers, Inc.
731 Ball Road, Suite 100
Anaheim, CA 92805

RE: **BARREN RIDGE RENEWABLE TRANSMISSION PROJECT PROPOSED BY LOS ANGELES DEPARTMENT OF WATER AND POWER DEIR/EIS**

Dear BRRTP Team:

I have reviewed the Draft Environmental Impact Report/Statement (DEIR/EIS) for the Barren Ridge Renewable Transmission Project (BRRTP) proposed by Los Angeles Department of Water and Power (LADWP). I am opposed to the project and recommend the No Project Alternative. As a community activist in the community of Agua Dulce, Alternative 3 is unacceptable as a viable alternative for the proposed project.

24-A The DEIR/EIS fails to satisfactorily report the full impact Alternative 3 would have on the community of Agua Dulce. While a number of areas have been examined in the report, there are numerous shortcomings.

24-B Alternative 3 is the only Alternative has will result in condemnation of property though the use of eminent domain. Seizure of private property for public use is a power that should only be utilized when all other options have been exhausted...and even then, the power should be exercised with extreme caution. If for no other reason, Alternative 3 should be abandoned from consideration based on this fact alone.

24-C The greatest number of affected residences, 242, would be within 1,000 feet of the transmission centerline for Alternative 3. This will result in socioeconomic impacts, visual impacts, traffic and transportation impacts, land use impacts, and public health and safety impacts. Not all of these impacts were addressed within the DEIR/EIS. By omitting these significant impacts, the true consequences are not recognized.

24-D The cumulative effects of this project along with the other renewable transmission projects are not properly addressed. There are a number of approved transmission projects and additional projects not yet at the approval stage. All of these projects and potential projects need to be evaluated to determine the actual cumulative impacts.

24-E I dispute the findings indicating Alternative 3 has only 1.5 miles of very high risk conditions for firefighter safety and obstruction to suppression. Wildfire danger is a condition the residents of

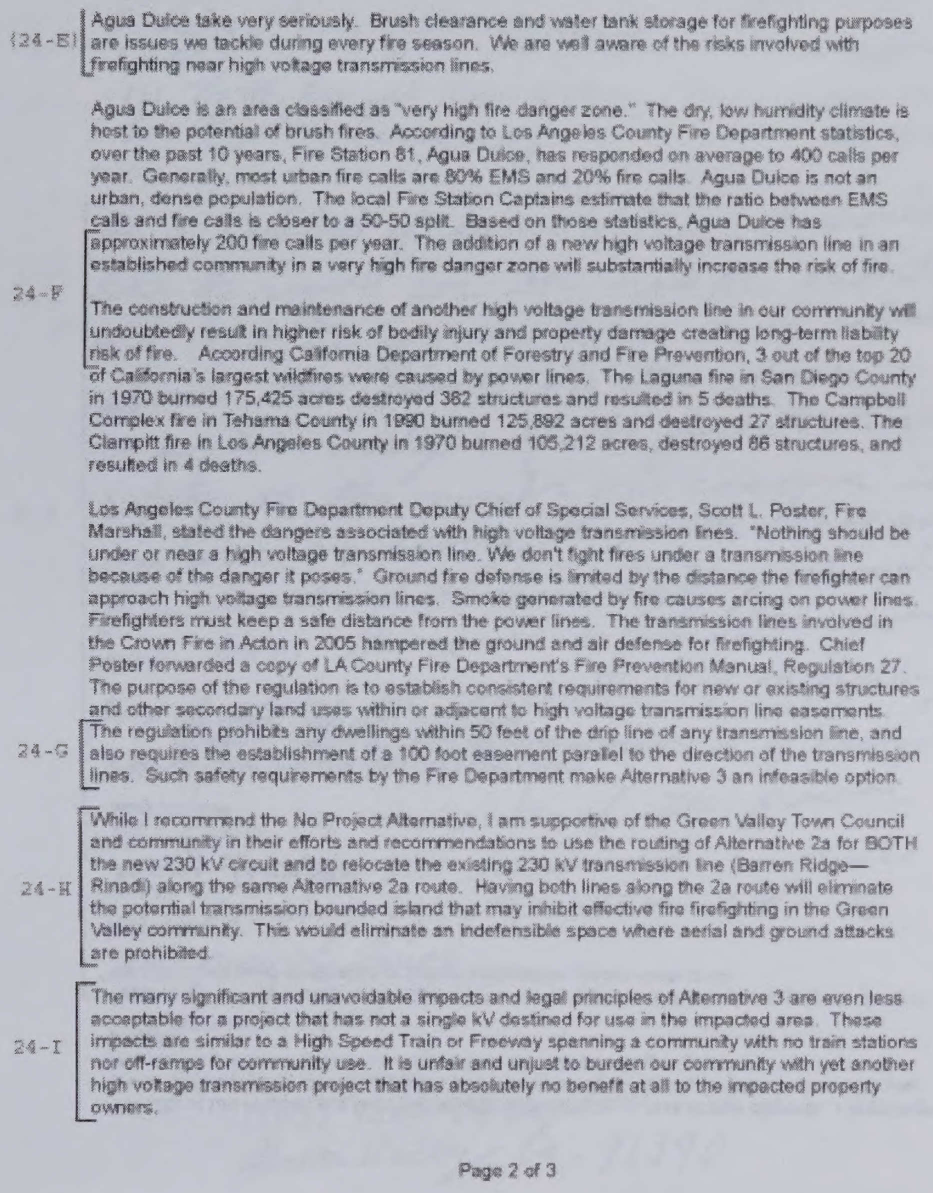
Page 1 of 3

Response 24-A: The impacts to residences in Agua Dulce and other communities are addressed for the Alternatives in Section 3.2.3 and Section 4.2.3 of the Final EIS/EIR.

Response 24-B: Private property necessary for the Project would be acquired from willing sellers where possible. It is not clear which private properties, if any, would require eminent domain to secure the property rights for the BRRTP. Alternative 3 is not the only Alternative where the potential for eminent domain would exist. As described in Sections 2.7 and 2.8 of the Final EIS/EIR, Alternative 3 is not considered to be the Federal Agency Preferred or Environmentally Superior Alternative because of higher overall impacts than Alternative 2, the Preferred Alternative.

Response 24-C: The impacts that you describe in your comment were addressed in the Draft EIS/EIR in Section 4.2.3 beginning on page 4-75, Section 4.2.8 beginning on page 4-222, Section 4.2.9 beginning on page 4-234, Section 4.2.13 beginning on page 4-336, and other sections of Chapter 4.

Response 24-D: Cumulative effects have been evaluated, and in fact are found in nearly 100 pages of analysis in Chapter 5 of the Draft EIS/EIR. Reasonably foreseeable projects to be analyzed in the Draft EIS/EIR were identified as those projects that have begun the environmental review process and not just those projects that are in LADWP's interconnection queue. For a full description of the methodology used in the cumulative effects analysis, see Section 5.1.1 of the Final EIS/EIR beginning on page 5-1. It is acknowledged that many projects in the interconnection queue will not be constructed, but it is not possible to know which ones at this



24-E Agua Dulce take very seriously. Brush clearance and water tank storage for firefighting purposes are issues we tackle during every fire season. We are well aware of the risks involved with firefighting near high voltage transmission lines.

Agua Dulce is an area classified as "very high fire danger zone." The dry, low humidity climate is host to the potential of brush fires. According to Los Angeles County Fire Department statistics, over the past 10 years, Fire Station 81, Agua Dulce, has responded on average to 400 calls per year. Generally, most urban fire calls are 80% EMS and 20% fire calls. Agua Dulce is not an urban, dense population. The local Fire Station Captains estimate that the ratio between EMS calls and fire calls is closer to a 50-50 split. Based on those statistics, Agua Dulce has
approximately 200 fire calls per year. The addition of a new high voltage transmission line in an established community in a very high fire danger zone will substantially increase the risk of fire.

24-F

The construction and maintenance of another high voltage transmission line in our community will undoubtedly result in higher risk of bodily injury and property damage creating long-term liability risk of fire. According California Department of Forestry and Fire Prevention, 3 out of the top 20 of California's largest wildfires were caused by power lines. The Laguna fire in San Diego County in 1970 burned 175,425 acres destroyed 382 structures and resulted in 5 deaths. The Campbell Complex fire in Tehama County in 1990 burned 125,892 acres and destroyed 27 structures. The Clampitt fire in Los Angeles County in 1970 burned 105,212 acres, destroyed 86 structures, and resulted in 4 deaths.

Los Angeles County Fire Department Deputy Chief of Special Services, Scott L. Poster, Fire Marshall, stated the dangers associated with high voltage transmission lines. "Nothing should be under or near a high voltage transmission line. We don't fight fires under a transmission line because of the danger it poses." Ground fire defense is limited by the distance the firefighter can approach high voltage transmission lines. Smoke generated by fire causes arcing on power lines. Firefighters must keep a safe distance from the power lines. The transmission lines involved in the Crown Fire in Acton in 2005 hampered the ground and air defense for firefighting. Chief Poster forwarded a copy of LA County Fire Department's Fire Prevention Manual, Regulation 27. The purpose of the regulation is to establish consistent requirements for new or existing structures and other secondary land uses within or adjacent to high voltage transmission line easements.
24-G The regulation prohibits any dwellings within 50 feet of the drip line of any transmission line, and also requires the establishment of a 100 foot easement parallel to the direction of the transmission lines. Such safety requirements by the Fire Department make Alternative 3 an infeasible option.

24-H While I recommend the No Project Alternative, I am supportive of the Green Valley Town Council and community in their efforts and recommendations to use the routing of Alternative 2a for BOTH the new 230 kV circuit and to relocate the existing 230 kV transmission line (Barren Ridge—Rinadi) along the same Alternative 2a route. Having both lines along the 2a route will eliminate the potential transmission bounded island that may inhibit effective fire firefighting in the Green Valley community. This would eliminate an indefensible space where aerial and ground attacks are prohibited.

24-I The many significant and unavoidable impacts and legal principles of Alternative 3 are even less acceptable for a project that has not a single kV destined for use in the impacted area. These impacts are similar to a High Speed Train or Freeway spanning a community with no train stations nor off-ramps for community use. It is unfair and unjust to burden our community with yet another high voltage transmission project that has absolutely no benefit at all to the impacted property owners.

Page 2 of 3

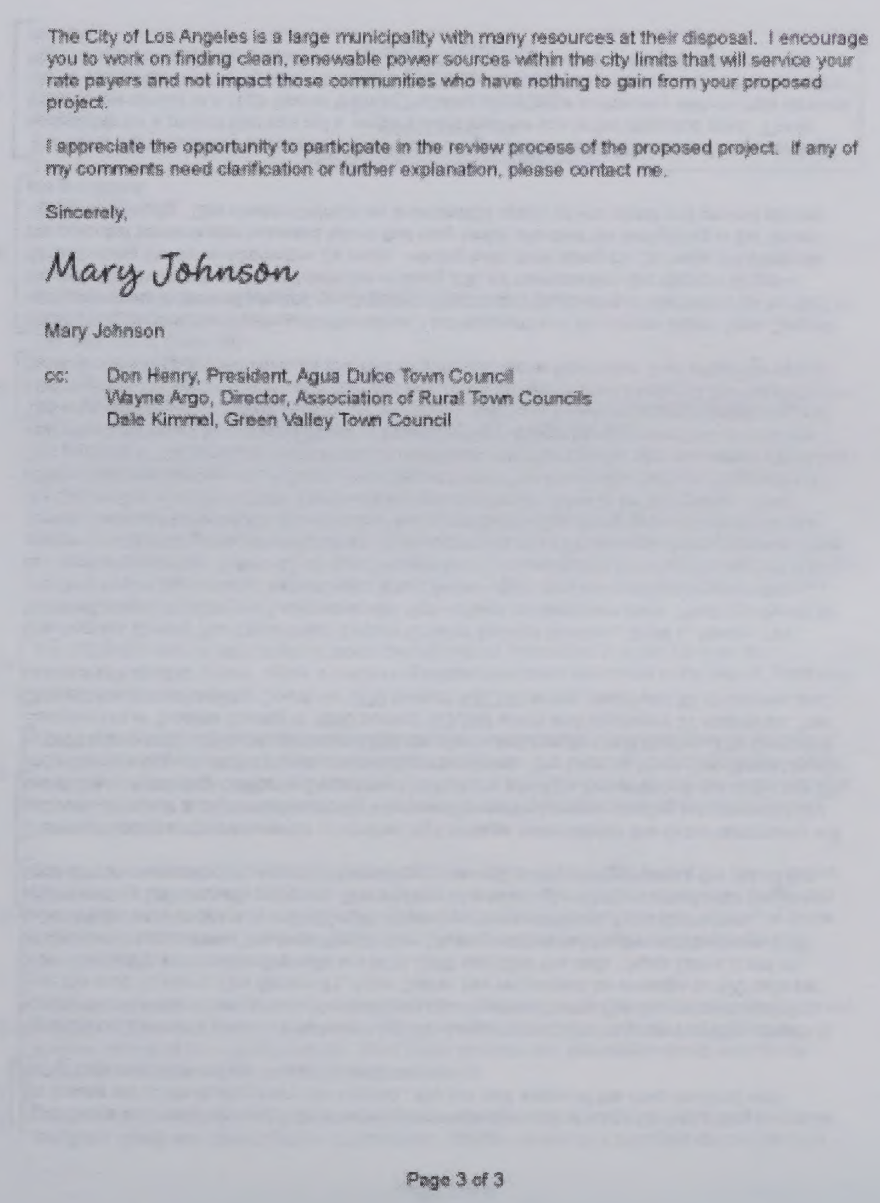
time. See Section 5.2 of the Final EIS/EIR beginning on page 5-3 for an updated description of the cumulative project list.

Response 24-E: The evaluation of fire risk was done uniformly across each of the Alternatives and specific criteria were used to make the determination about the areas identified as having high fire risk. These criteria were used across each of the Alternatives to help form the basis of comparing Alternatives. Please refer to the Wildfire and Fuels Technical Report in Volume III of the Final EIS/EIR and to Sections 3.2.11 and 4.2.11 of the Final EIS/EIR for a discussion of the criteria used to determine fire risk.

Response 24-F: Significant fire risk is already present in the areas described in Section 3.2.11 of the Final EIS/EIR, and the new transmission line adds an increment of risk. This has been taken into account in the analysis. Fire risk is one of the elements considered by the agencies in determining the Federal Agency Preferred and Environmentally Superior Alternative, which has been identified as Alternative 2 as described in Section 2.7 and 2.8 in the Final EIS/EIR.

Response 24-G: Fire regulations relative to transmission lines was taken into account in the analysis (refer to the Wildfire and Fuels Technical Report in Volume III of the Final EIS/EIR and to Section 4.2.11 of the Final EIS/EIR). Fire risk is one of the elements considered by the agencies in determining the Preferred Alternative, which has been identified as Alternative 2.

Response 24-H: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



The City of Los Angeles is a large municipality with many resources at their disposal. I encourage you to work on finding clean, renewable power sources within the city limits that will service your rate payers and not impact those communities who have nothing to gain from your proposed project.

I appreciate the opportunity to participate in the review process of the proposed project. If any of my comments need clarification or further explanation, please contact me.

Sincerely,

Mary Johnson

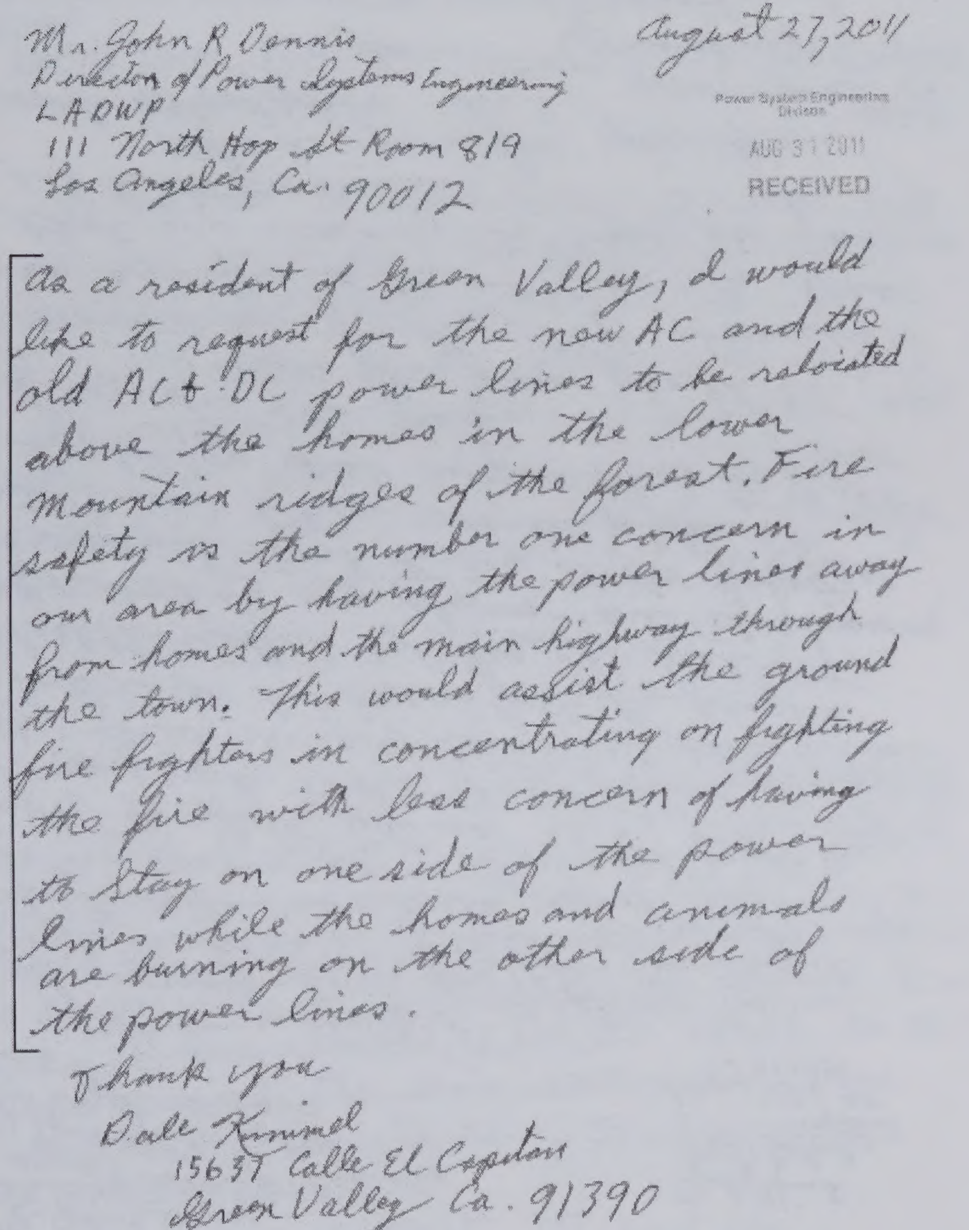
Mary Johnson

cc: Don Henry, President, Agua Dulce Town Council
Wayne Argo, Director, Association of Rural Town Councils
Dale Kimmel, Green Valley Town Council

Page 3 of 3

Response 24-I: A primary benefit of the Project is to bring renewable energy to the City of Los Angeles, but the addition of the BRRTP also makes cleaner, renewable energy more available to the public as a whole and, as such, is a benefit to the region.

INDIVIDUAL COMMENT LETTER 25: KIMMEL, D.



August 27, 2011

Mr. John R Dennis
Director of Power Systems Engineering
LADWP
111 North Hop St Room 819
Los Angeles, Ca. 90012

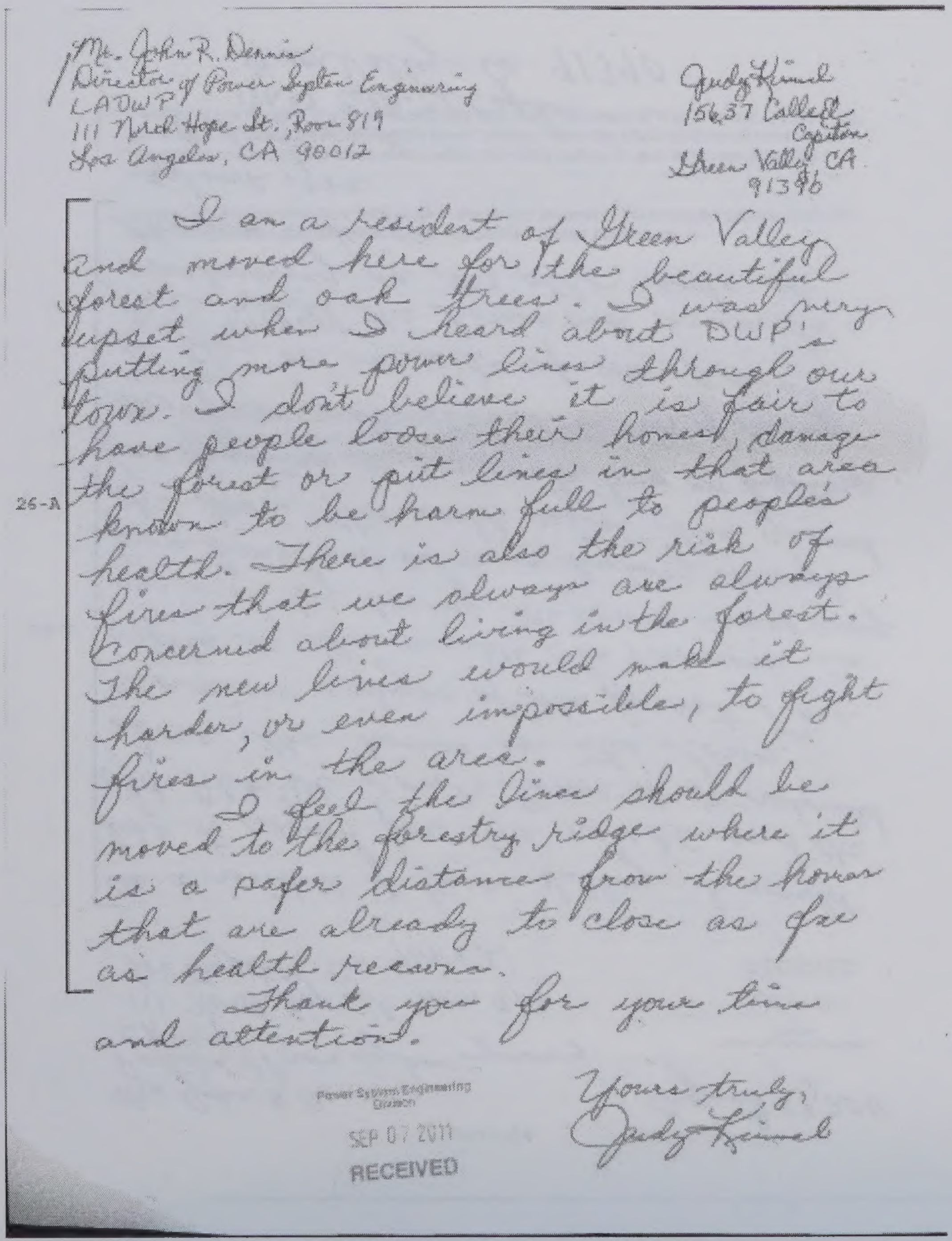
Power System Engineering Division
AUG 31 2011
RECEIVED

As a resident of Green Valley, I would
like to request for the new AC and the
old AC + DC power lines to be relocated
above the homes in the lower
mountain ridges of the forest. Fire
25-A safety is the number one concern in
our area by having the power lines away
from homes and the main highway through
the town. This would assist the ground
fire fighters in concentrating on fighting
the fire with less concern of having
to Stay on one side of the power
lines while the homes and animals
are burning on the other side of
the power lines.

Thank you
Dale Kimmel
15637 Calle El Capitan
Green Valley Ca. 91390

Response 25-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 26: KIMMEL, J.



Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St., Room 819
Los Angeles, CA 90012

Judy Kimmel
15637 Calle El
Capitan
Green Valley CA
91396

26-A I an a resident of Green Valley and moved here for the beautiful forest and oak trees. I was very upset when I heard about DWP's putting more power lines through our town. I don't believe it is fair to have people loose their homes, damage the forest or put lines in that area known to be harm full to people's health. There is also the risk of fires that we always are always concernd about living in the forest. The new lines would make it harder, or even impossible, to fight fires in the area.

I feel the lines should be moved to the forestry ridge where it is a safer distance from the homes that are already to close as far as health reasons.

Thank you for your time and attention.

Yours truly,
Judy Kimmel

Power System Engineering
Division
SEP 07 2011
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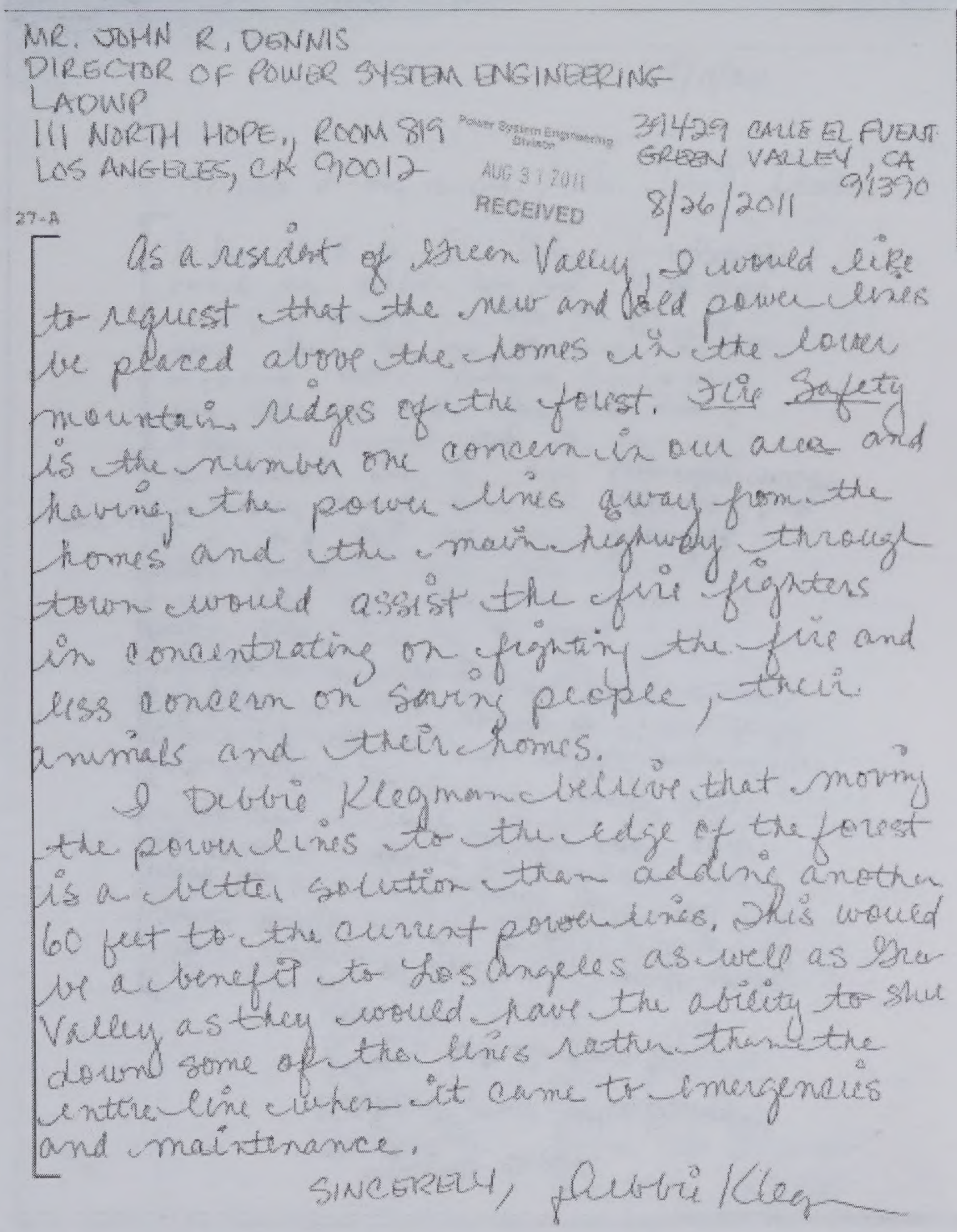
Response 26-A: A primary benefit of the Project is to bring renewable energy to the City of Los Angeles, but the addition of the BRRTP also makes cleaner, renewable energy more available to the public as a whole and, as such, is a benefit to the region.

Also please refer to Response 2-A. Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR).



MR. JOHN R. DENNIS
DIRECTOR OF POWER SYSTEM ENGINEERING
LADWP
111 NORTH HOPE, ROOM 819
LOS ANGELES, CA 90012

Power System Engineering Division
AUG 31 2011
RECEIVED

39429 CALLE EL PUENT
GREEN VALLEY, CA
91390
8/26/2011

27-A

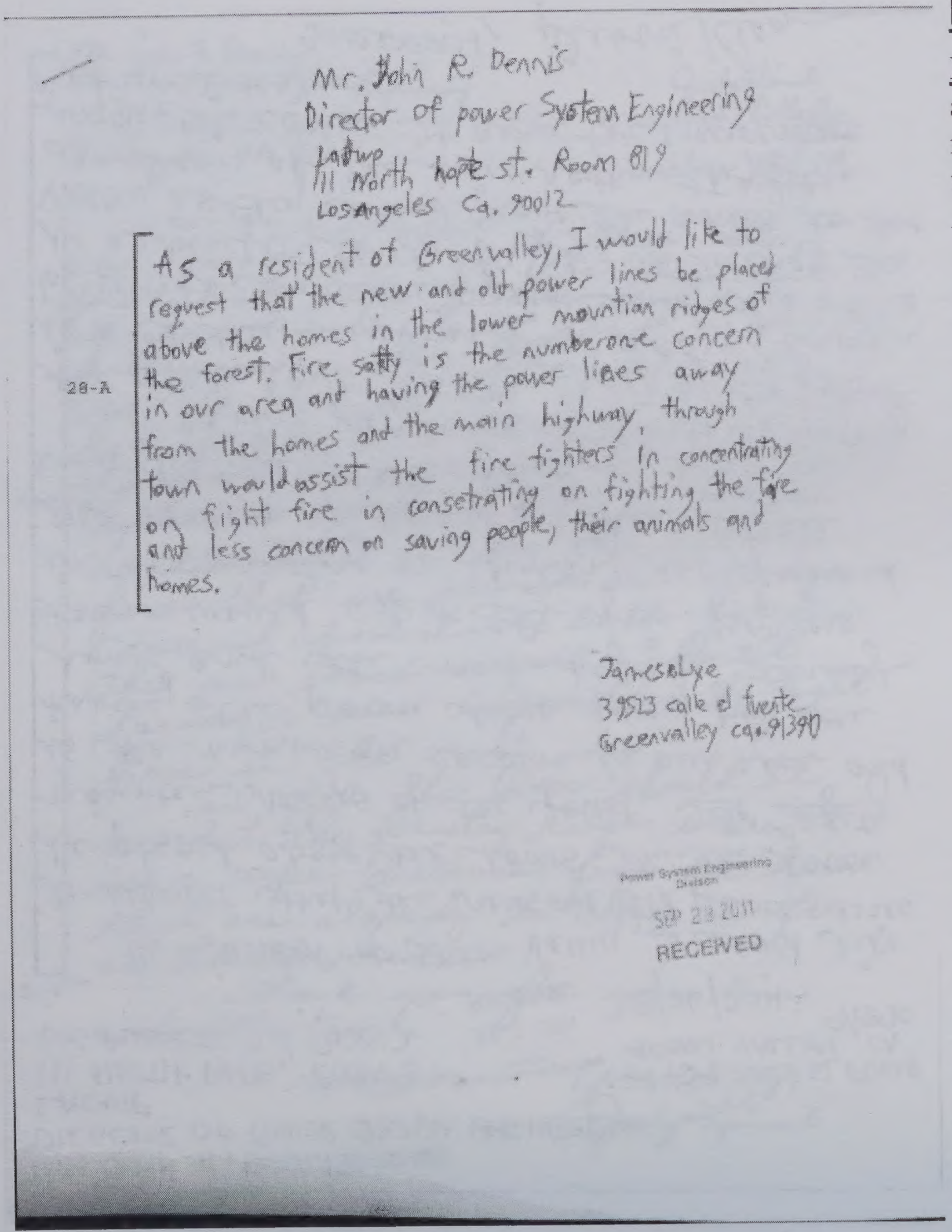
As a resident of Green Valley, I would like to request that the new and old power lines be placed above the homes in the lower mountain ridges of the forest. Fire Safety is the number one concern in our area and having the power lines away from the homes and the main highway through town would assist the fire fighters in concentrating on fighting the fire and less concern on saving people, their animals and their homes.

I Debbie Klegman believe that moving the power lines to the edge of the forest is a better solution than adding another 60 feet to the current power lines, This would be a benefit to Los Angeles as well as Gre Valley as they would have the ability to shu down some of the lines rather than the entire line when it came to emergencies and maintenance.

SINCERELY, Debbie Kleg

INDIVIDUAL COMMENT LETTER 27: KLEGMAN, D.

Response 27-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



Mr. John R. Dennis
Director of power System Engineering
Ladwp
111 North hope st. Room 819
LosAngeles Ca. 90012

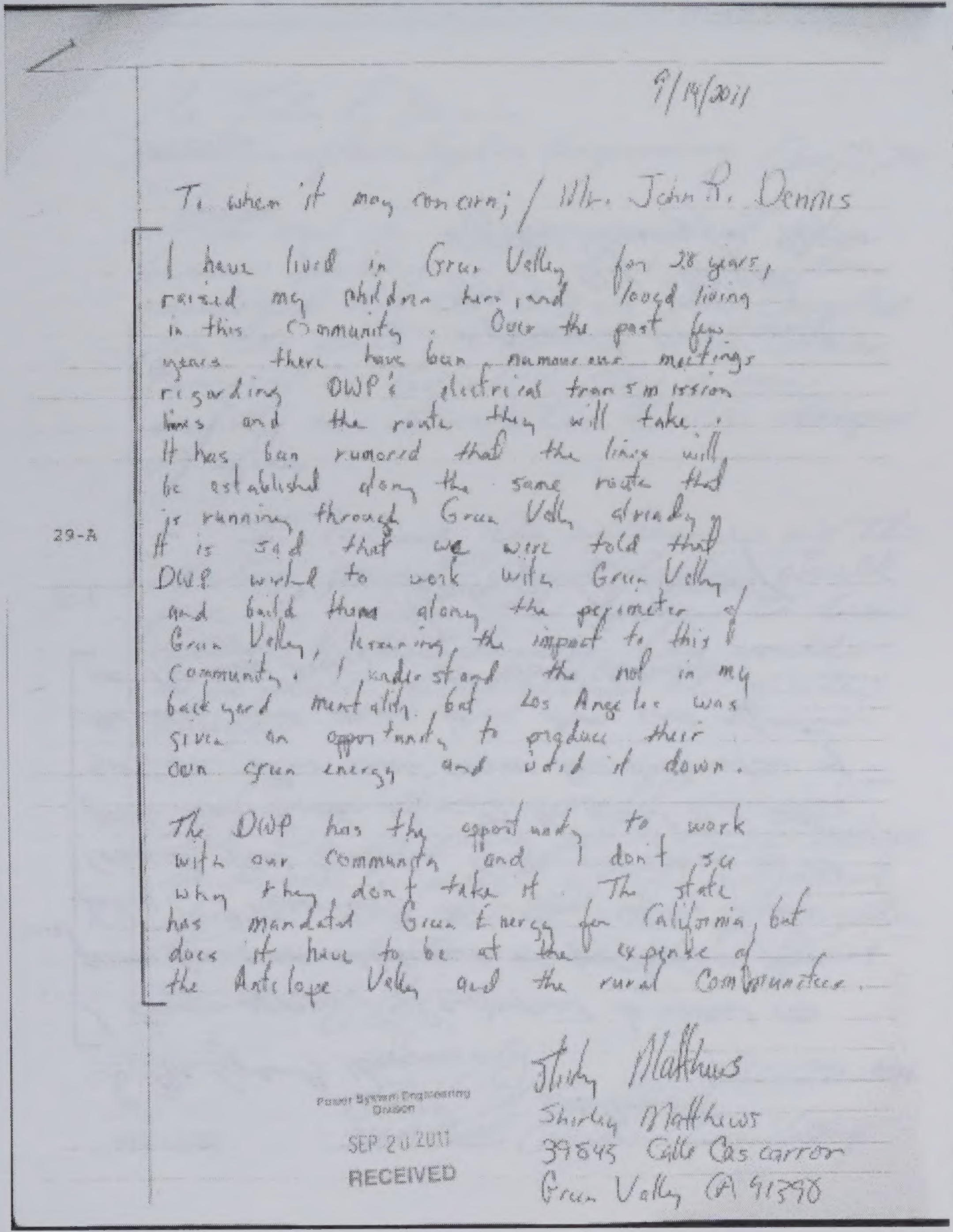
28-A As a resident of Greenvalley, I would like to request that the new and old power lines be placed above the homes in the lower mountian ridges of the forest. Fire satty is the numberone concern in our area and having the power lines away from the homes and the main highway, through town would assist the fire fighters in concentrating on fight fire in consetrating on fighting the fire and less concern on saving people, their animals and homes.

JamesLye
39513 calle el fuerte
Greenvalley ca. 91390

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 28: LYE, J.R.

Response 28-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers, as proposed (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



9/19/2011

To whom it may concern; / Mr. John R. Dennis

29-A I have lived in Green Valley for 28 years, raised my children here, and loved living in this Community. Over the past few years there have been numerous meetings regarding DWP's electrical transmission lines and the route they will take. It has been rumored that the lines will be established along the same route that is running through Green Valley already. It is sad that we were told that DWP wished to work with Green Valley and build them along the perimeter of Green Valley, lessening the impact to this community. I understand the not in my back yard mentality, but Los Angeles was given an opportunity to produce their own green energy and voted it down.

The DWP has the opportunity to work with our community and I don't see why they don't take it. The state has mandated Green Energy for California, but does it have to be at the expense of the Antelope Valley and the rural Communities.

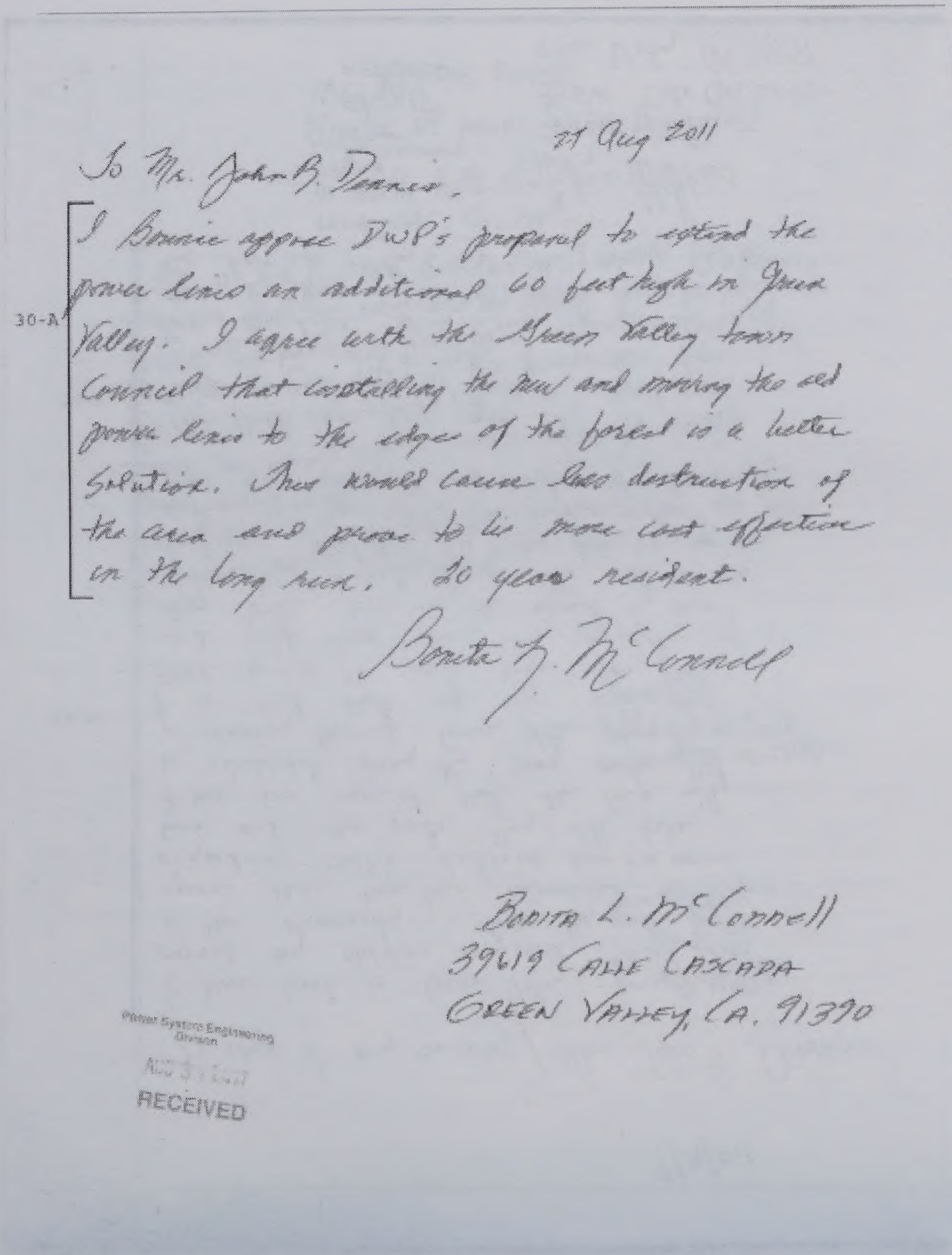
Shirley Matthews

Shirley Matthews
39845 Calle Cascarron
Green Valley CA 91390

Power System Engineering Division
SEP 20 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 29: MATTHEWS, S.

Response 29-A: A primary benefit of the Project is to bring renewable energy to the City of Los Angeles; however, the addition of the BRRTP makes clean, renewable energy more available to the public and, as such, is a benefit to the region. LADWP has worked with Green Valley throughout the process and will continue working with the community.



27 Aug 2011

To Mr. John B. Dennis,

30-A I Bonnie oppose DWP's proposal to extend the power lines an additional 60 feet high in Green Valley. I agree with the Green Valley town Council that installing the new and moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective in the long run. 20 year resident.

Bonita L. McConnell

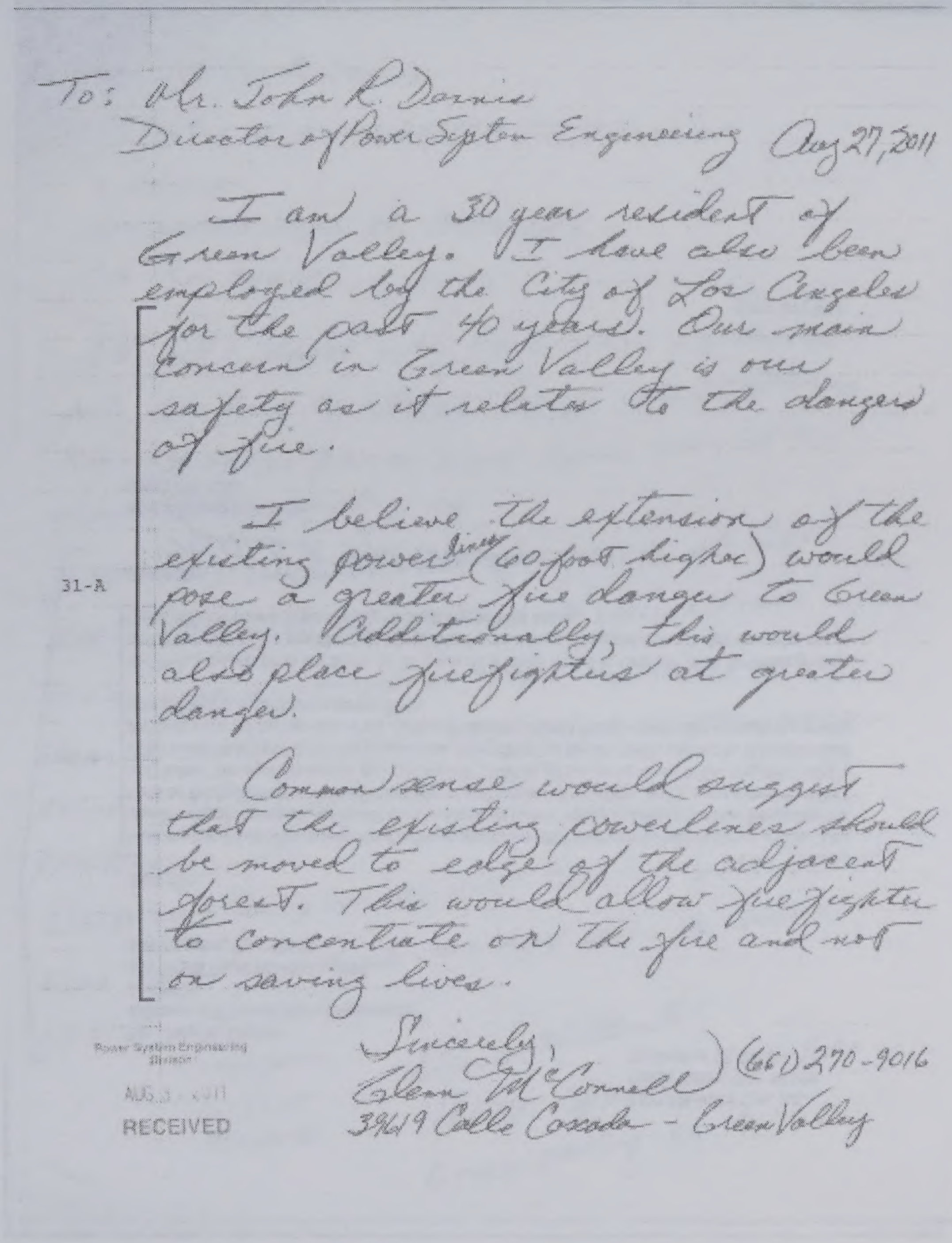
BONITA L. McCONNELL
39619 CALLE CASCADA
GREEN VALLEY, CA. 91390

Power System Engineering Division
AUG 31 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 30: MCCONNELL, B.

Response 30-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 31: MCCONNELL, G.



To: Mr. John R. Dennis
Director of Power System Engineering Aug 27, 2011

I am a 30 year resident of Green Valley. I have also been employed by the City of Los Angeles for the past 40 years. Our main concern in Green Valley is our safety as it relates to the dangers of fire.

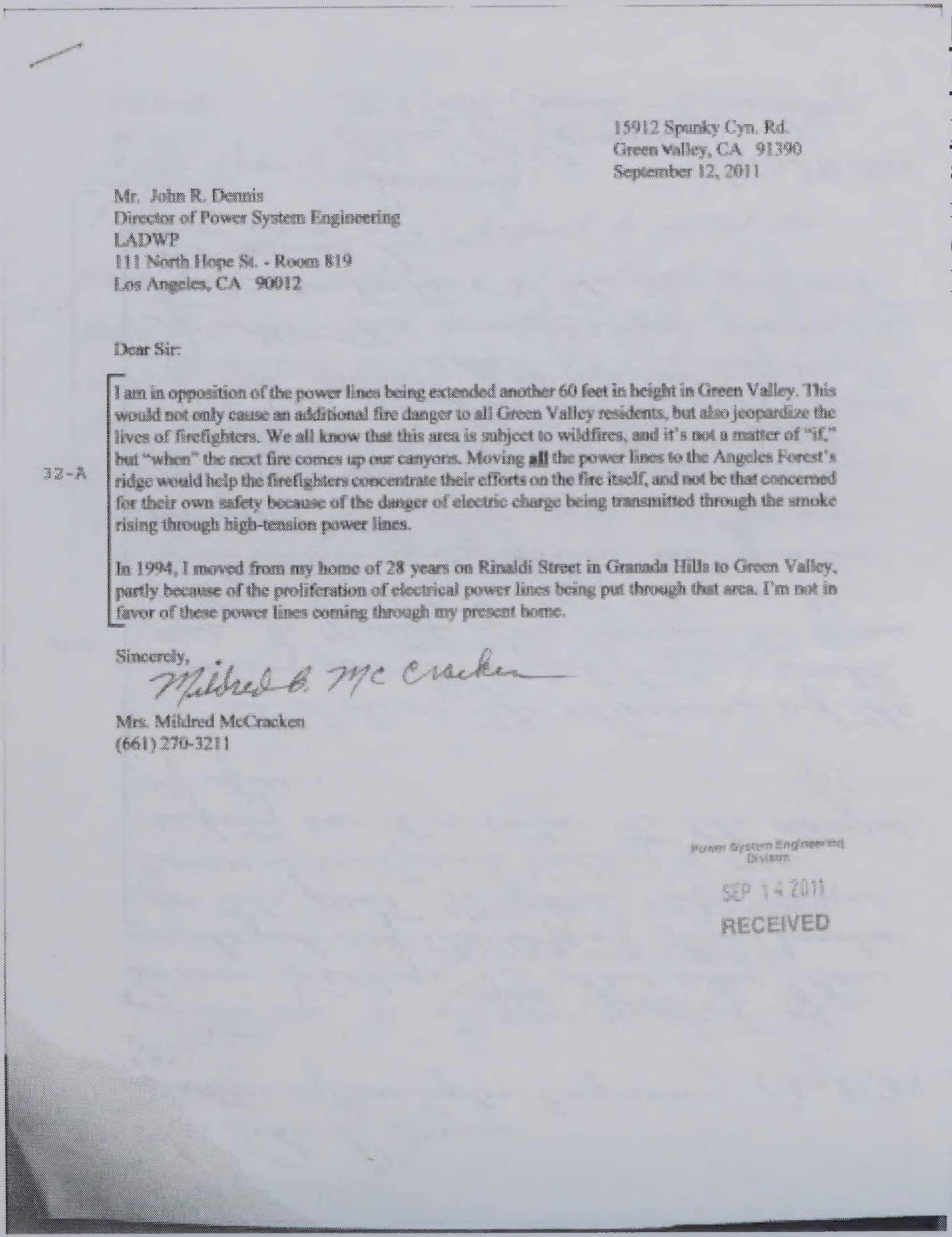
31-A I believe the extension of the existing power lines (60 foot higher) would pose a greater fire danger to Green Valley. Additionally, this would also place firefighters at greater danger.

Common sense would suggest that the existing powerlines should be moved to edge of the adjacent forest. This would allow firefighter to concentrate on the fire and not on saving lives.

Sincerely,
Glenn McConnell (661) 270-9016
39619 Calle Cascada - Green Valley

Power System Engineering Division
AUG 3 - 2011
RECEIVED

Response 31-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



15912 Spunky Cyn. Rd.
Green Valley, CA 91390
September 12, 2011

Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St. - Room 819
Los Angeles, CA 90012

Dear Sir:

32-A I am in opposition of the power lines being extended another 60 feet in height in Green Valley. This would not only cause an additional fire danger to all Green Valley residents, but also jeopardize the lives of firefighters. We all know that this area is subject to wildfires, and it's not a matter of "if," but "when" the next fire comes up our canyons. Moving **all** the power lines to the Angeles Forest's ridge would help the firefighters concentrate their efforts on the fire itself, and not be that concerned for their own safety because of the danger of electric charge being transmitted through the smoke rising through high-tension power lines.

In 1994, I moved from my home of 28 years on Rinaldi Street in Granada Hills to Green Valley, partly because of the proliferation of electrical power lines being put through that area. I'm not in favor of these power lines coming through my present home.

Sincerely,
Mildred B. McCracken

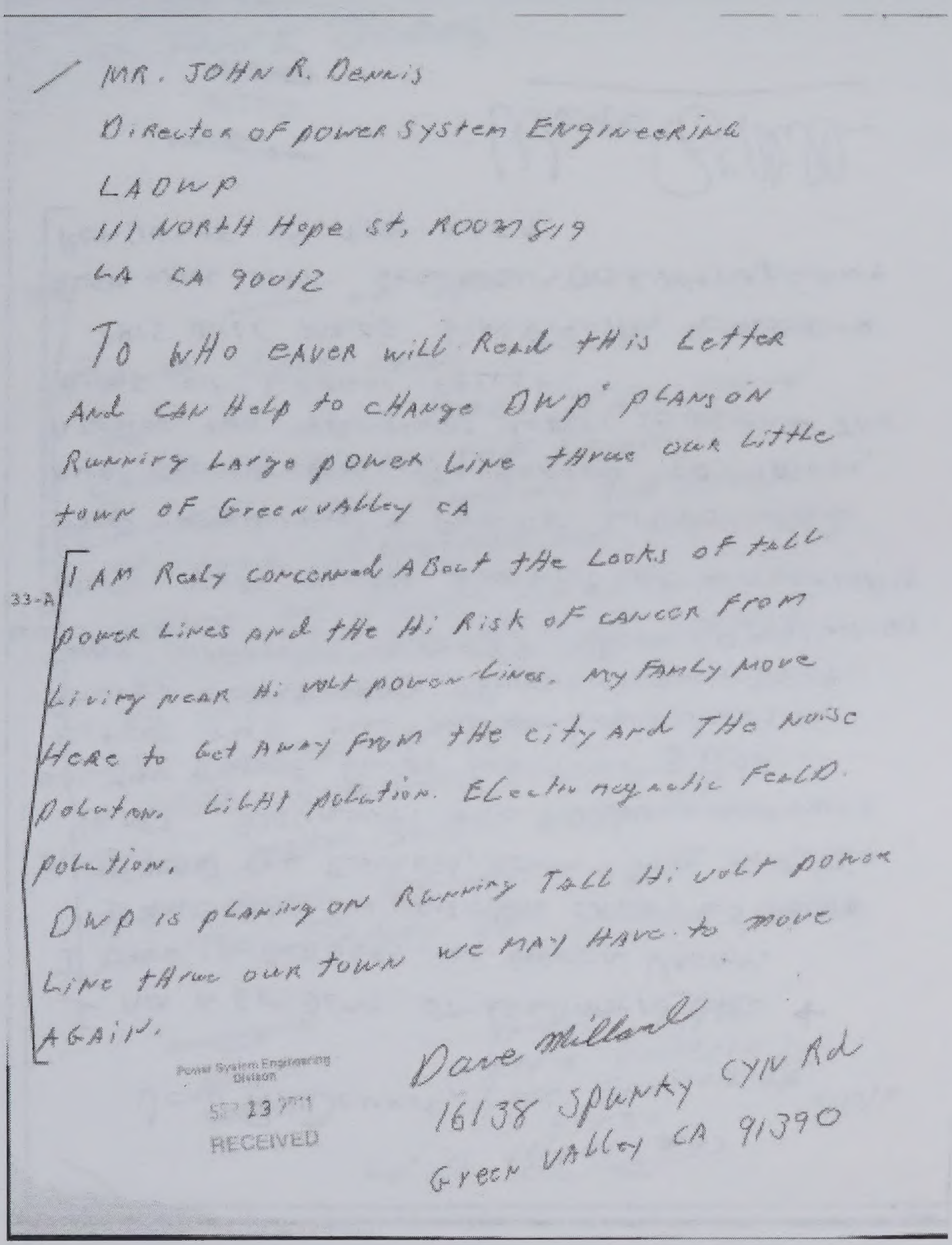
Mrs. Mildred McCracken
(661) 270-3211

Power System Engineering
Division
SEP 14 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 32: MCCRACKEN, M.

Response 32-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 33: MILLARD, D.



/ MR. JOHN R. Dennis
Director of power System Engineering
LADWP
111 NORTH Hope St, ROOM 819
LA CA 90012

To who eaver will Read this Letter And can Help to change DWP' plans on Running Large power Line thrue our little town of Greenvalley CA

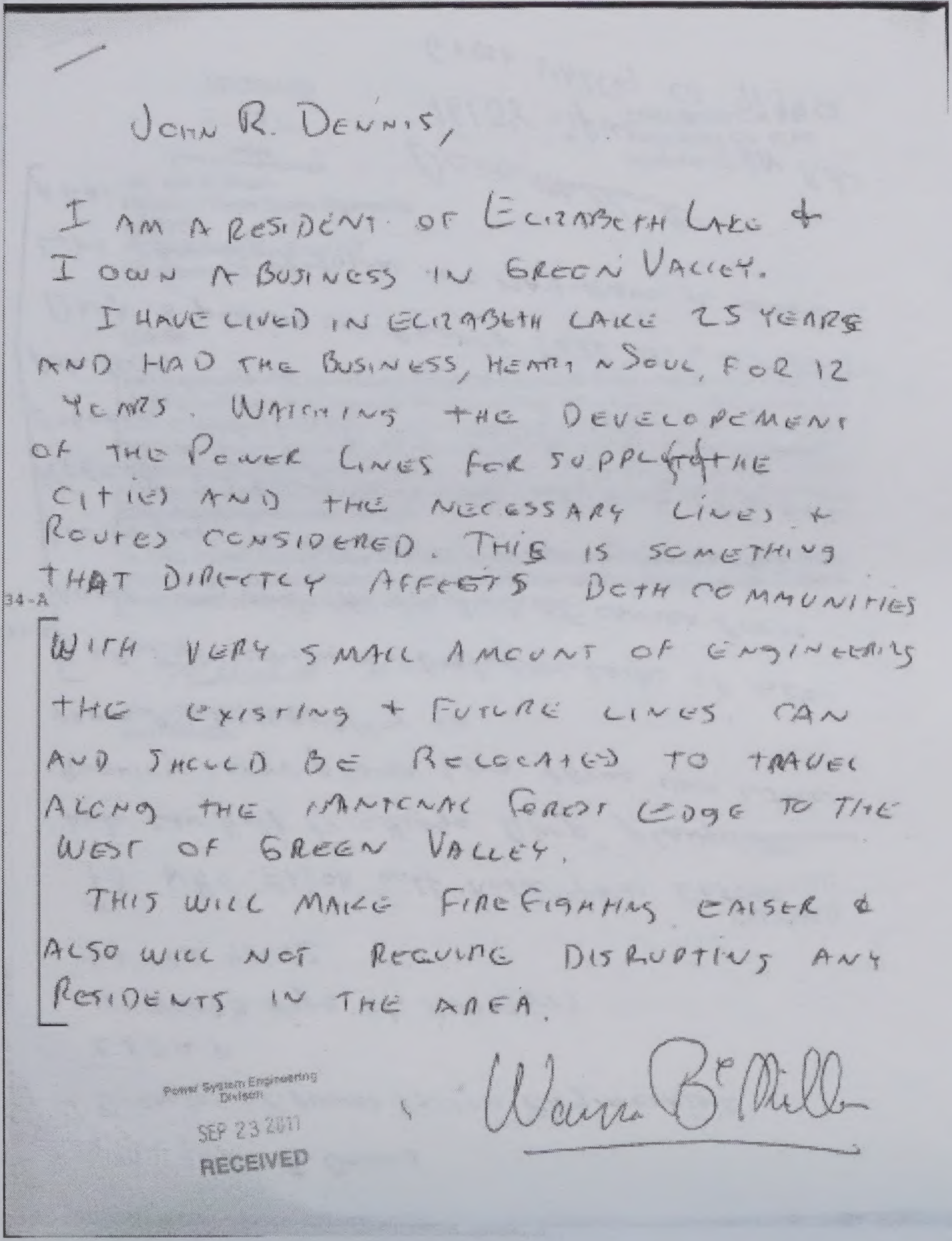
33-A I AM Realy concerned About the Looks of tall power Lines and the Hi Risk of cancer from Living near Hi volt power lines. My Famly move Here to get Away from the city and The noise polution. Light polution. Electro magnetic Feild. polution.

DWP is planing on Running Tall Hi volt power Line thrue our town we may Have to move AGAIN.

Dave Millard
16138 Spunky CYN Rd
Green valley CA 91390

Power System Engineering Division
SEP 23 2011
RECEIVED

Response 33-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



JOHN R. DENNIS,

I AM A RESIDENT OF ELIZABETH LAKE & I OWN A BUSINESS IN GREEN VALLEY.

I HAVE LIVED IN ELIZABETH LAKE 25 YEARS AND HAD THE BUSINESS, HEART N SOUL, FOR 12 YEARS. WATCHING THE DEVELOPEMENT OF THE POWER LINES FOR SUPPLY THE CITIES AND THE NECESSARY LINES & ROUTES CONSIDERED. THIS IS SOMETHING THAT DIRECTLY AFFECTS BOTH COMMUNITIES

34-A

WITH VERY SMALL AMOUNT OF ENGINEERING THE EXISTING + FUTURE LINES CAN AND SHOULD BE RELOCATED TO TRAVEL ALONG THE NATIONAL FOREST EDGE TO THE WEST OF GREEN VALLEY.

THIS WILL MAKE FIREFIGHTING EAISER & ALSO WILL NOT REQUIRE DISRUPTING ANY RESIDENTS IN THE AREA.

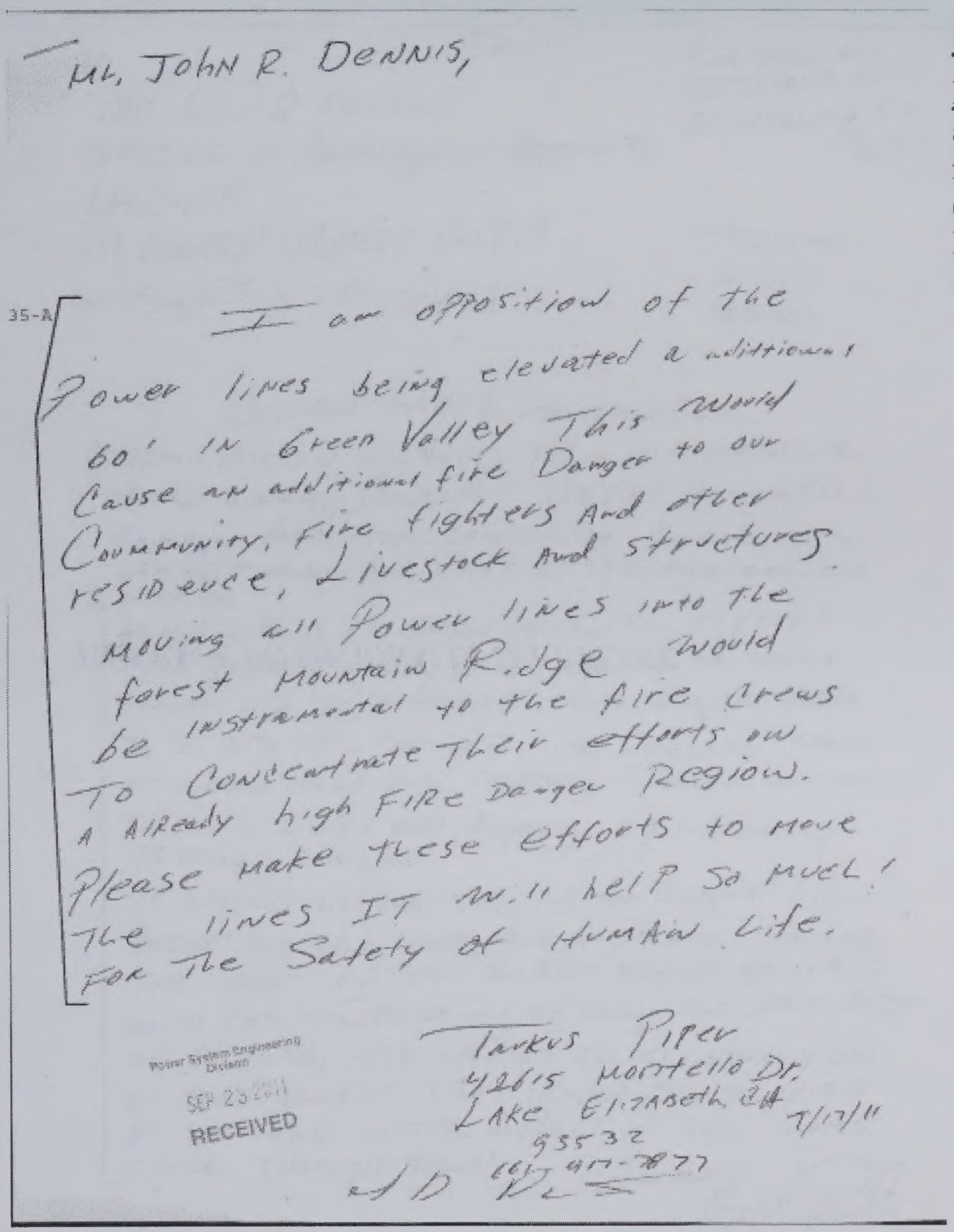
Warren B. Miller

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 34: MILLER, W.B.

Response 34-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 35: PIPER, T.



Mr. John R. Dennis,

35-A I am opposition of the Power lines being elevated a additional 60' in Green Valley This would Cause an additional fire Danger to our Community. Fire fighters And other residence, Livestock And structures. moving all Power lines into the forest Mountain Ridge would be instramental to the fire Crews To Concentrate Their efforts on A Already high FIRE Danger Region. Please make these efforts to move The lines IT will help So much! For The Safety of Human Life.

Tarkus Piper
42615 Mortello Dr.
Lake Elizabeth CA 7/17/11
93532
(661) 917-7877

Power System Engineering Division
SEP 23 2011
RECEIVED

Response 35-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

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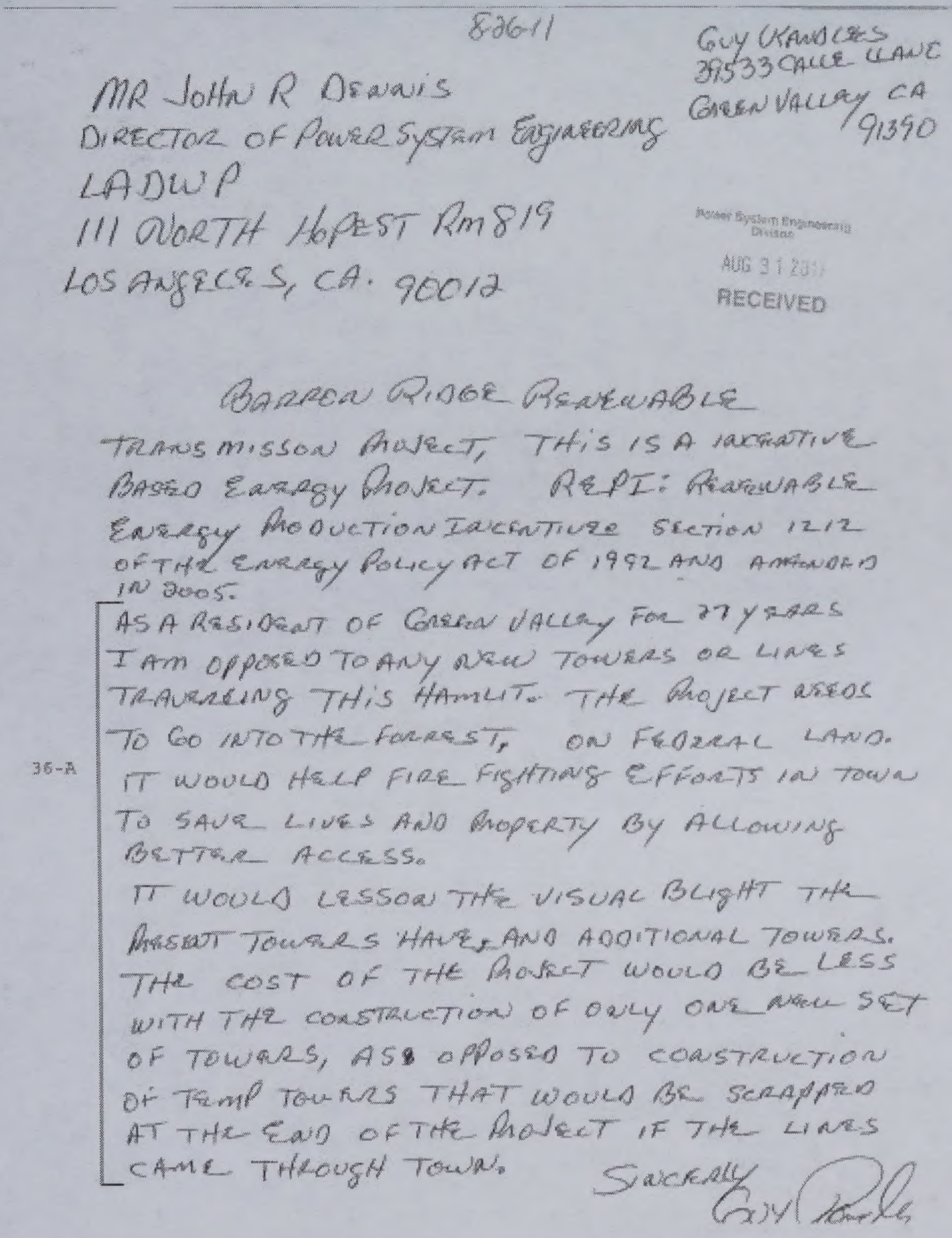

8-26-11

GUY RANDLES
39533 CALLE LANE
GREEN VALLEY CA
91390

MR JOHN R DENNIS
DIRECTOR OF POWER SYSTEM ENGINEERING
LADWP
111 NORTH HOPE ST RM 819
LOS ANGELES, CA. 90012

Power System Engineering
Division
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BARREN RIDGE RENEWABLE TRANSMISSON PROJECT, THIS IS A INCENTIVE BASED ENERGY PROJECT. REPI: RENEWABLE ENERGY PRODUCTION INCENTIVE SECTION 1212 OF THE ENERGY POLICY ACT OF 1992 AND AMENDED IN 2005.

AS A RESIDENT OF GREEN VALLEY FOR 77 YEARS I AM OPPOSED TO ANY NEW TOWERS OR LINES TRAVERSING THIS HAMLIT. THE PROJECT NEEDS TO GO INTO THE FORREST, ON FEDERAL LAND.

36-A IT WOULD HELP FIRE FIGHTING EFFORTS IN TOWN TO SAVE LIVES AND PROPERTY BY ALLOWING BETTER ACCESS.

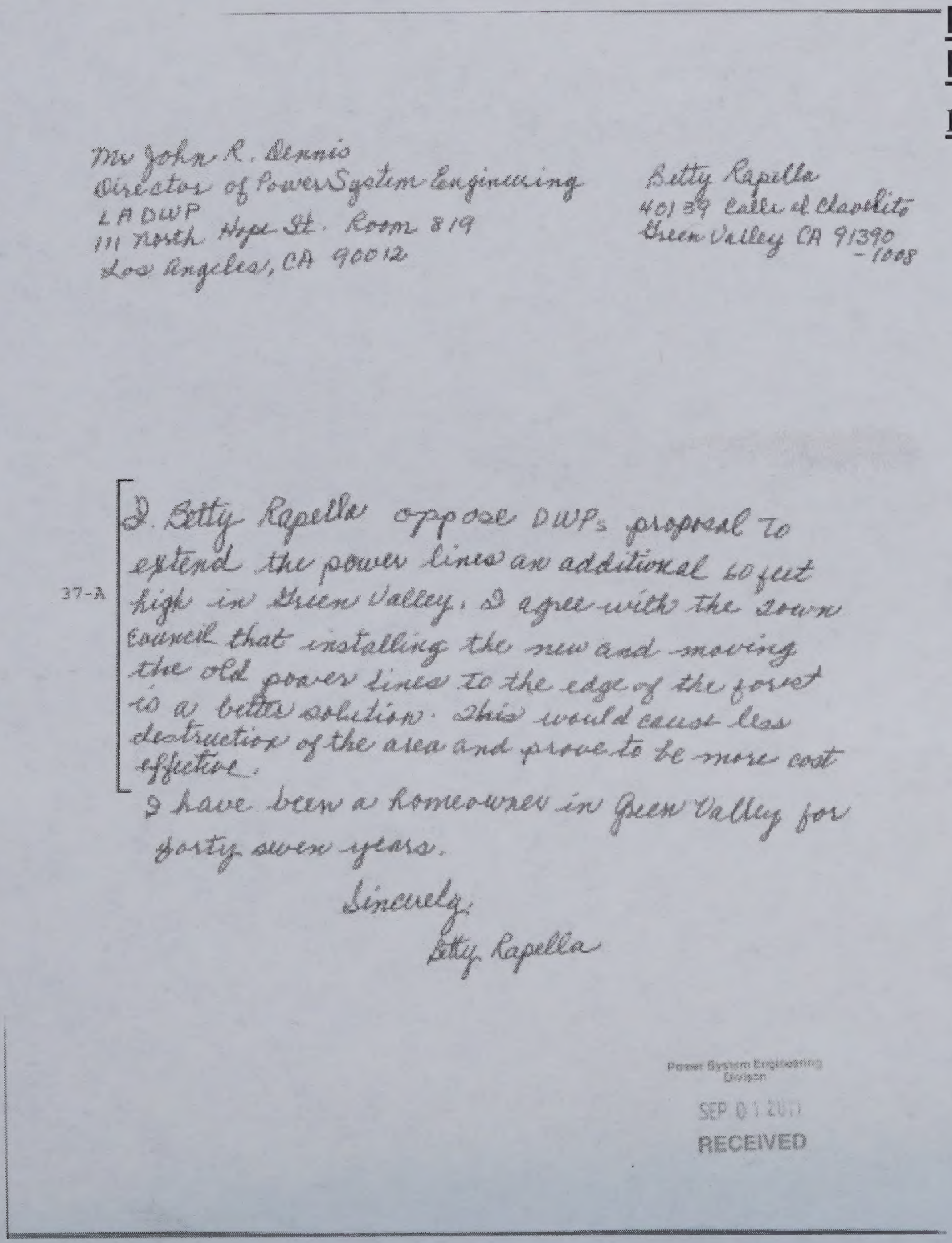
IT WOULD LESSON THE VISUAL BLIGHT THE PRESENT TOWERS HAVE, AND ADDITIONAL TOWERS. THE COST OF THE PROJECT WOULD BE LESS WITH THE CONSTRUCTION OF ONLY ONE NEW SET OF TOWERS, AS OPPOSED TO CONSTRUCTION OF TEMP TOWERS THAT WOULD BE SCRAPPED AT THE END OF THE PROJECT IF THE LINES CAME THROUGH TOWN.

SINCERELY
GUY RANDLES

INDIVIDUAL COMMENT LETTER 36: RANDLES, G.

Response 36-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 37: RAPELLA, B.



Mr John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St. Room 819
Los Angeles, CA 90012

Betty Rapella
40139 Calle el Clavelito
Green Valley CA 91390-1008

37-A I. Betty Rapella oppose DWPs proposal to extend the power lines an additional 60 feet high in Green Valley. I agree with the Town Council that installing the new and moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective.

I have been a homeowner in Green Valley for forty seven years.

Sincerely,
Betty Rapella

Power System Engineering
Division
SEP 01 2011
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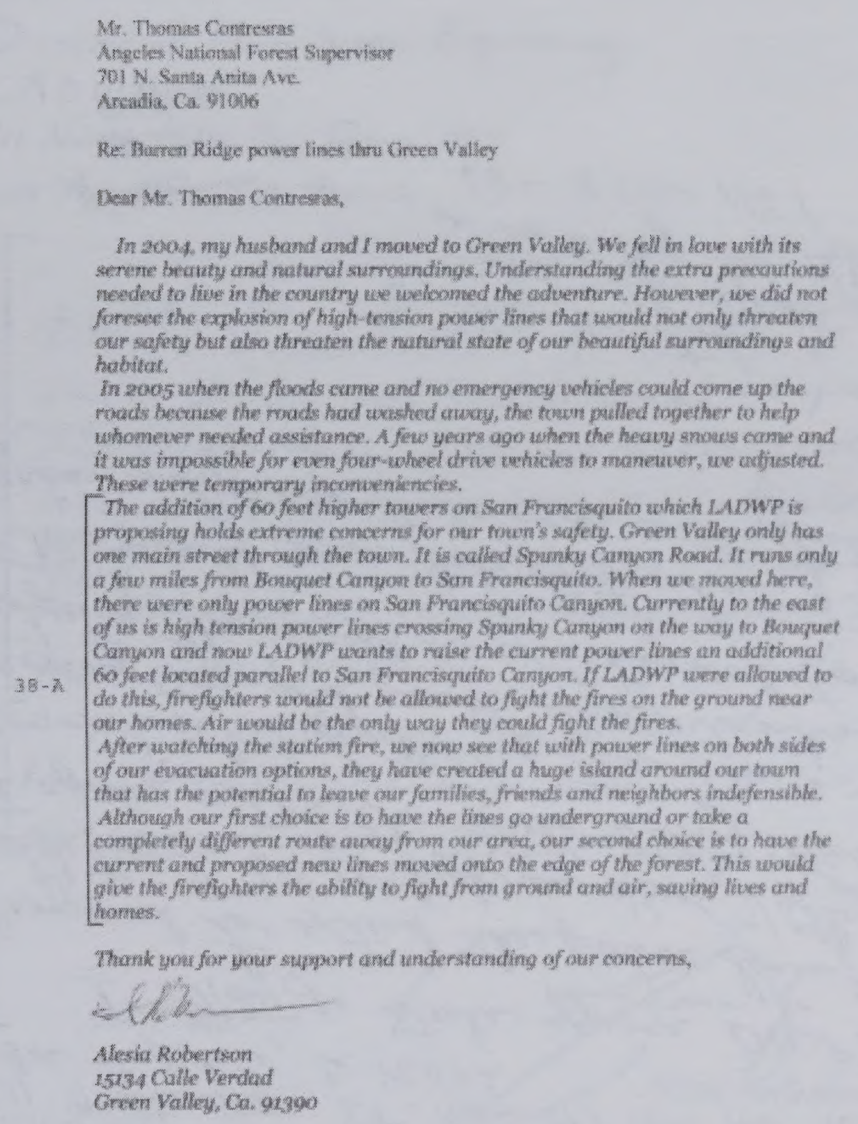
Response 37-A: Please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 38: ROBERTSON, A.



Mr. Thomas Contresras
Angeles National Forest Supervisor
701 N. Santa Anita Ave.
Arcadia, Ca. 91006

Re: Barren Ridge power lines thru Green Valley

Dear Mr. Thomas Contresras,

In 2004, my husband and I moved to Green Valley. We fell in love with its serene beauty and natural surroundings. Understanding the extra precautions needed to live in the country we welcomed the adventure. However, we did not foresee the explosion of high-tension power lines that would not only threaten our safety but also threaten the natural state of our beautiful surroundings and habitat.

In 2005 when the floods came and no emergency vehicles could come up the roads because the roads had washed away, the town pulled together to help whomever needed assistance. A few years ago when the heavy snows came and it was impossible for even four-wheel drive vehicles to maneuver, we adjusted. These were temporary inconveniencies.

38-A *The addition of 60 feet higher towers on San Francisquito which LADWP is proposing holds extreme concerns for our town's safety. Green Valley only has one main street through the town. It is called Spunky Canyon Road. It runs only a few miles from Bouquet Canyon to San Francisquito. When we moved here, there were only power lines on San Francisquito Canyon. Currently to the east of us is high tension power lines crossing Spunky Canyon on the way to Bouquet Canyon and now LADWP wants to raise the current power lines an additional 60 feet located parallel to San Francisquito Canyon. If LADWP were allowed to do this, firefighters would not be allowed to fight the fires on the ground near our homes. Air would be the only way they could fight the fires.*

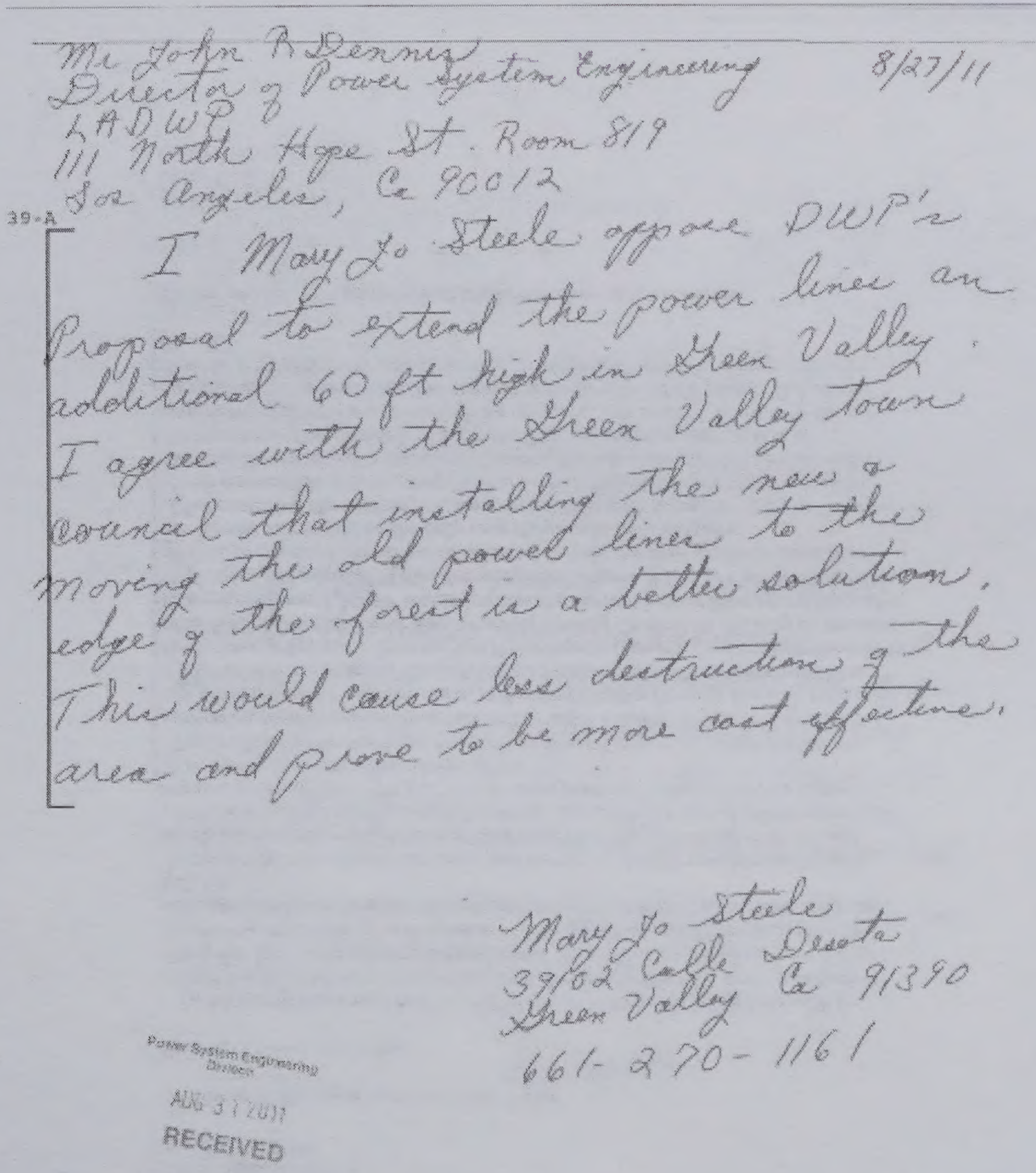
After watching the station fire, we now see that with power lines on both sides of our evacuation options, they have created a huge island around our town that has the potential to leave our families, friends and neighbors indefensible.

Although our first choice is to have the lines go underground or take a completely different route away from our area, our second choice is to have the current and proposed new lines moved onto the edge of the forest. This would give the firefighters the ability to fight from ground and air, saving lives and homes.

Thank you for your support and understanding of our concerns,

Alesia Robertson
15134 Calle Verdad
Green Valley, Ca. 91390

Response 38-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



Mr John R Dennis
Director of Power System Engineering 8/27/11
LADWP
111 North Hope St. Room 819
Los Angeles, Ca 90012

39-A I Mary Jo Steele oppose DWP's Proposal to extend the power lines an additional 60 ft high in Green Valley. I agree with the Green Valley town council that installing the new & moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective.

Mary Jo Steele
39162 Calle Desota
Green Valley Ca 91390
661-270-1161

Power System Engineering Division
AUG 31 2011
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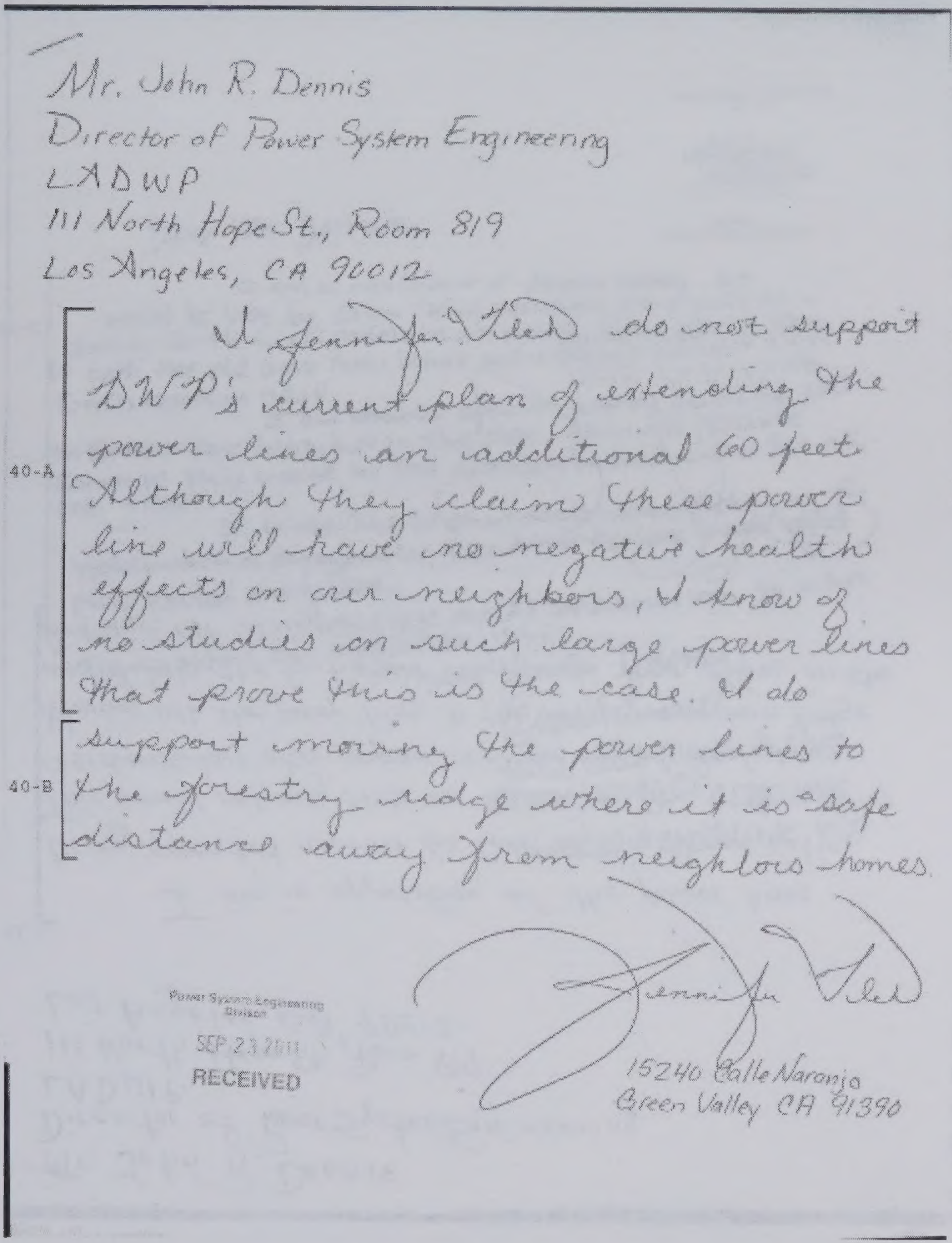
INDIVIDUAL COMMENT LETTER 39: STEELE, M.J.

Response 39-A: Please refer to Response 2-A.

INDIVIDUAL COMMENT LETTER 40: TILCH, J.



Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St., Room 819
Los Angeles, CA 90012

40-A I Jennifer Tilch do not support DWP's current plan of extending the power lines an additional 60 feet. Although they claim these power line will have no negative health effects on our neighbors, I know of no studies on such large power lines that prove this is the case.

40-B I do support moving the power lines to the forestry ridge where it is a safe distance away from neighbors homes.

Jennifer Tilch

15240 Calle Naranjo
Green Valley CA 91390

Power System Engineering Division
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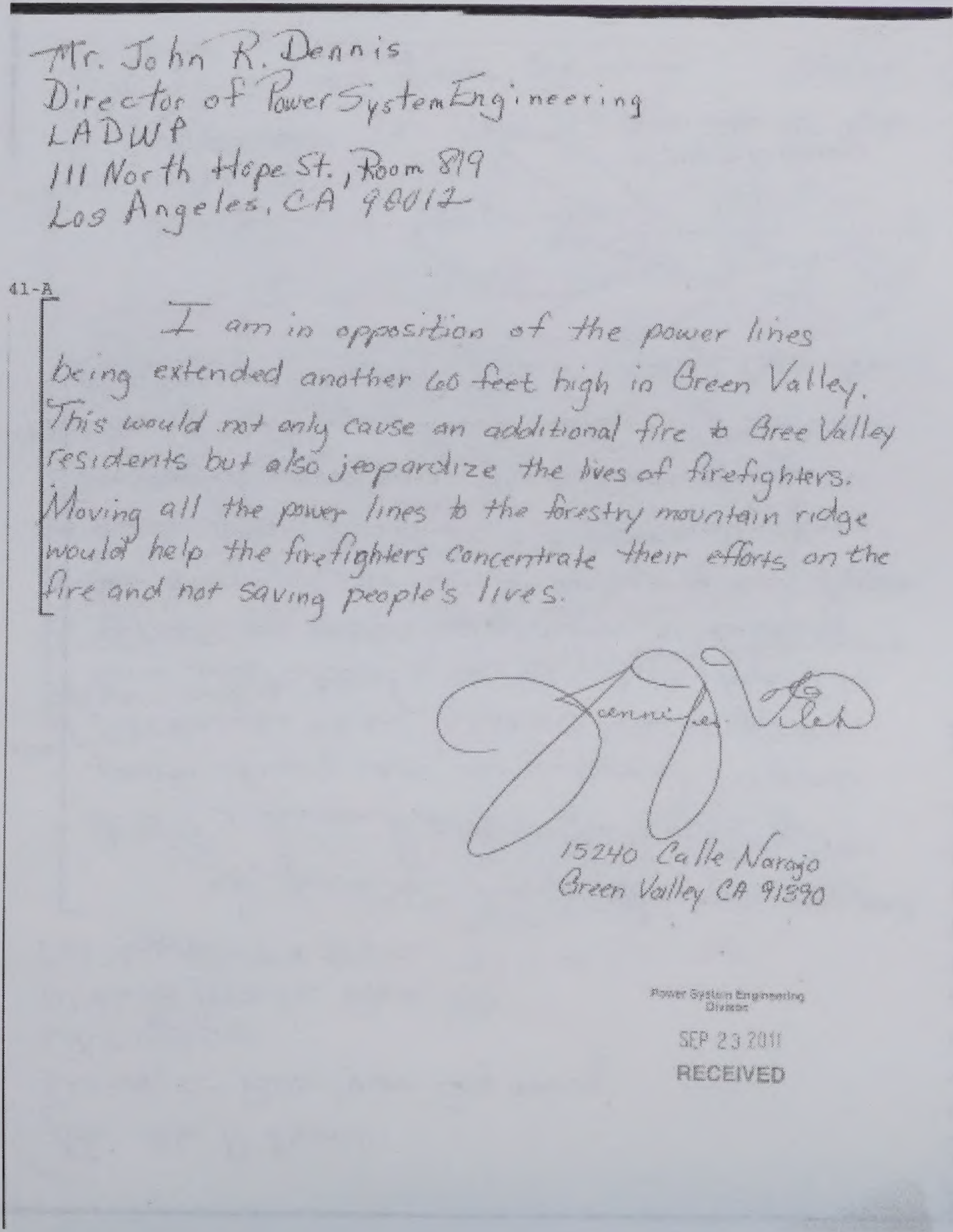
Response 40-A: Scientific research utilizes epidemiology studies, animal models, and laboratory studies of basic mechanisms to scientifically evaluate a disease risk. Based upon a comprehensive review of the scientific literature, the association between electric and magnetic fields and adverse health effects is weak and research is continuing. Please refer to Section 3.2.12 of the Final EIS/EIR for a discussion of current international research findings regarding health effects of electric and magnetic fields. Please refer to Section 4.2.12 of the Final EIS/EIR for the analysis of electrical effects of the Proposed Action and Alternatives.

Response 40-B: Please refer to Response 2-A.



Mr. John R. Dennis
Director of Power System Engineering
LADWP
111 North Hope St., Room 819
Los Angeles, CA 90012

41-A

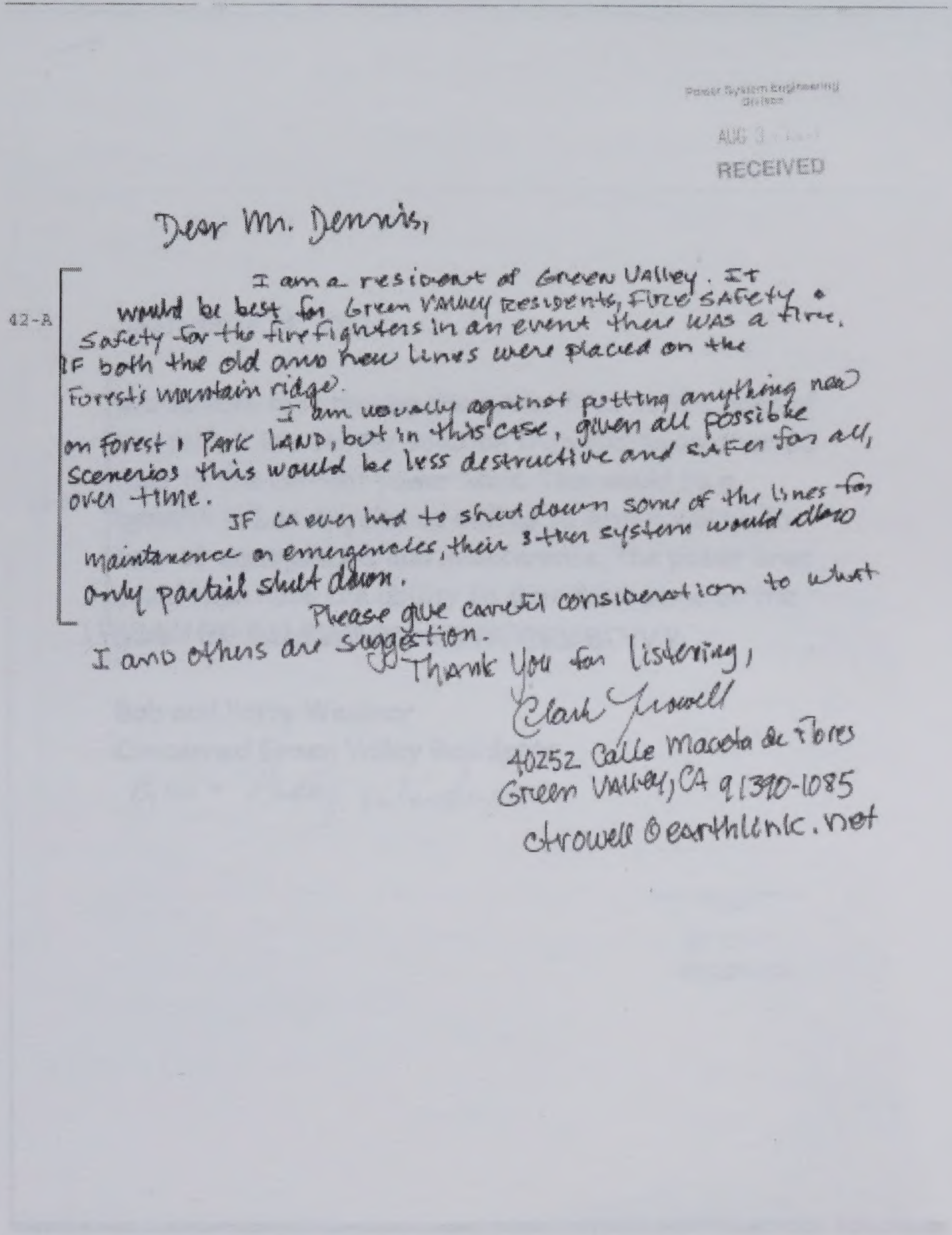
I am in opposition of the power lines being extended another 60 feet high in Green Valley. This would not only cause an additional fire to Gree Valley residents but also jeopardize the lives of firefighters. Moving all the power lines to the forestry mountain ridge would help the firefighters concentrate their efforts on the fire and not saving people's lives.

Jennifer Tilch
15240 Calle Narajo
Green Valley CA 91390

Power System Engineering Division
SEP 23 2011
RECEIVED

INDIVIDUAL COMMENT LETTER 41: TILCH, J.

Response 41-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



Power System Engineering
Division

AUG 3

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Dear Mr. Dennis,

42-A I am a resident of Green Valley. It would be best for Green Valley residents, Fire safety & safety for the firefighters in an event there was a fire, IF both the old and new lines were placed on the Forest's mountain ridge.

I am usually against putting anything new on Forest & Park LAND, but in this case, given all possible scenarios this would be less destructive and SAFER for all, over time.

IF LA ever had to shut down some of the lines for maintenance or emergencies, their 3-tier system would also only partial shut down.

Please give careful consideration to what I and others are suggestion.

Thank You for listening,

Clark Trowell
40252 Calle Maceta de Flores
Green Valley, CA 91390-1085
ctrowell@earthlink.net

INDIVIDUAL COMMENT LETTER 42: TROWELL, C.

Response 42-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

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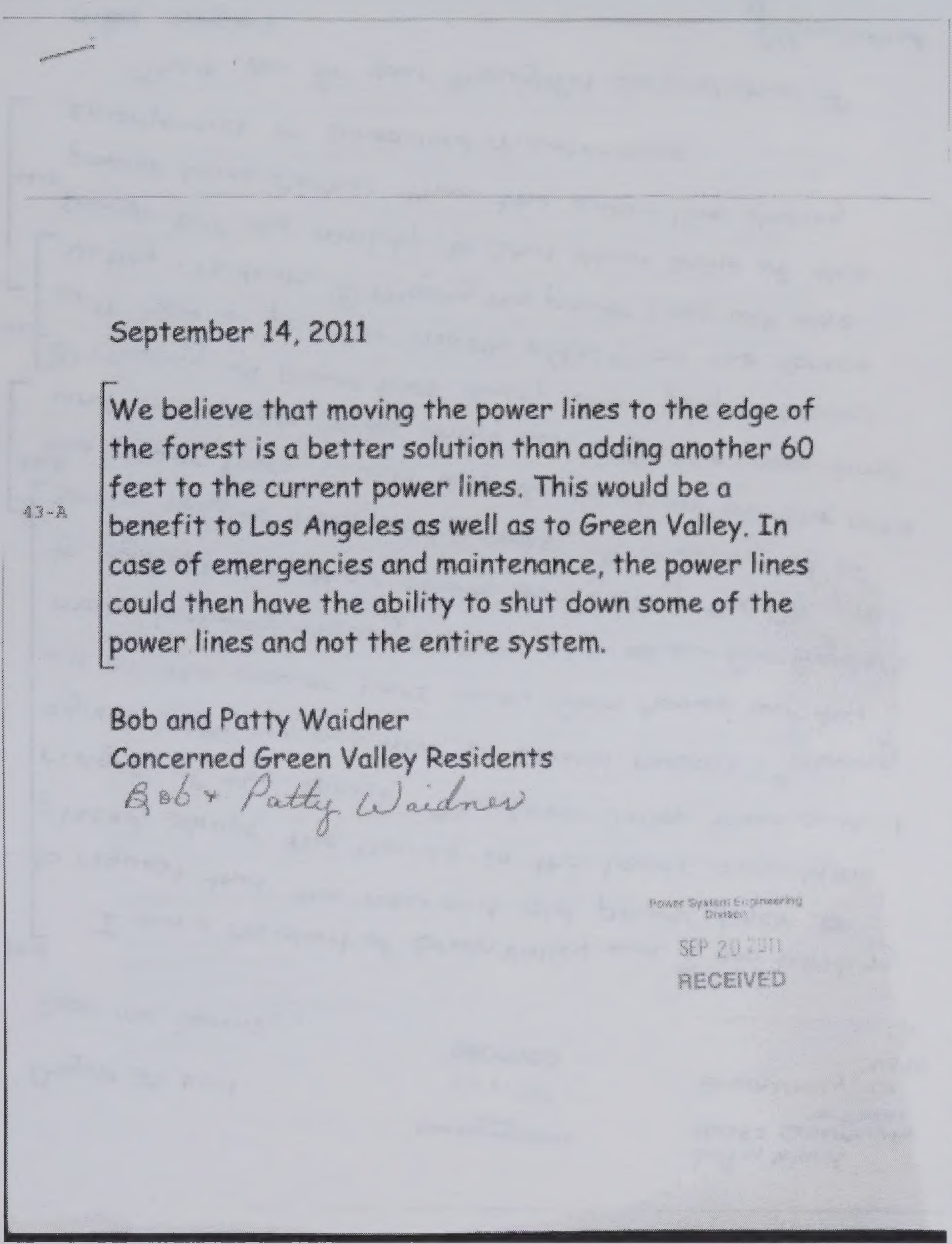

September 14, 2011

43-A We believe that moving the power lines to the edge of the forest is a better solution than adding another 60 feet to the current power lines. This would be a benefit to Los Angeles as well as to Green Valley. In case of emergencies and maintenance, the power lines could then have the ability to shut down some of the power lines and not the entire system.

Bob and Patty Waidner
Concerned Green Valley Residents
Bob + Patty Waidner

Power System Engineering
Division
SEP 20 2011
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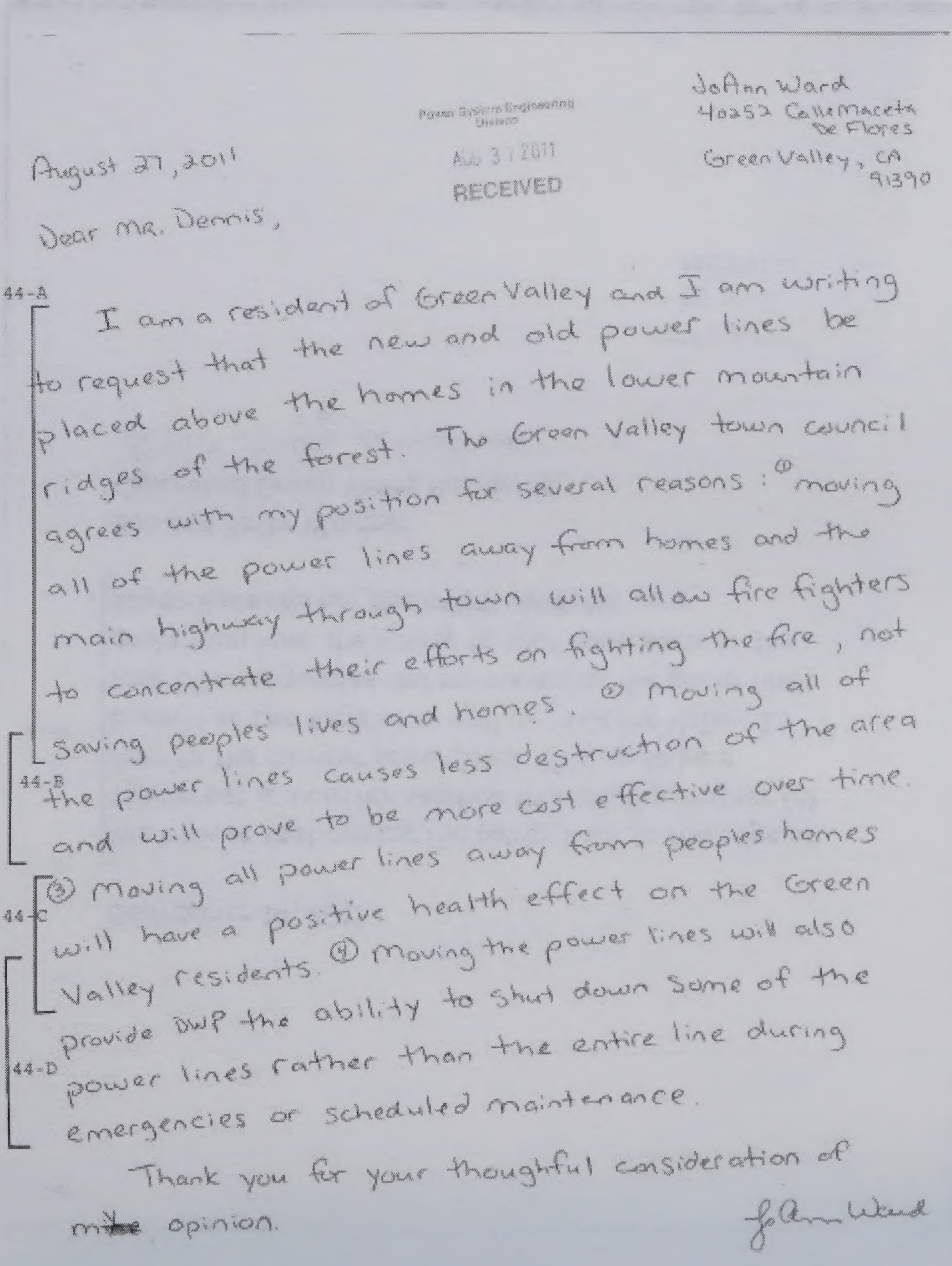
INDIVIDUAL COMMENT LETTER 43: WAIDNER, B. & P.

Response 43-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.



JoAnn Ward
40252 Calle Maceta
De Flores
Green Valley, CA
91390

Power System Engineering
Division
AUG 31 2011
RECEIVED

August 27, 2011

Dear Mr. Dennis,

44-A I am a resident of Green Valley and I am writing
to request that the new and old power lines be
placed above the homes in the lower mountain
ridges of the forest. The Green Valley town council
agrees with my position for several reasons: ① moving
all of the power lines away from homes and the
main highway through town will allow fire fighters
to concentrate their efforts on fighting the fire, not
saving peoples' lives and homes. ② Moving all of
44-B the power lines causes less destruction of the area
and will prove to be more cost effective over time.
44-C ③ Moving all power lines away from peoples homes
will have a positive health effect on the Green
Valley residents. ④ Moving the power lines will also
44-D provide DWP the ability to shut down some of the
power lines rather than the entire line during
emergencies or scheduled maintenance.

Thank you for your thoughtful consideration of
m~~ine~~y opinion.

JoAnn Ward

INDIVIDUAL COMMENT LETTER 44: WARD, J.

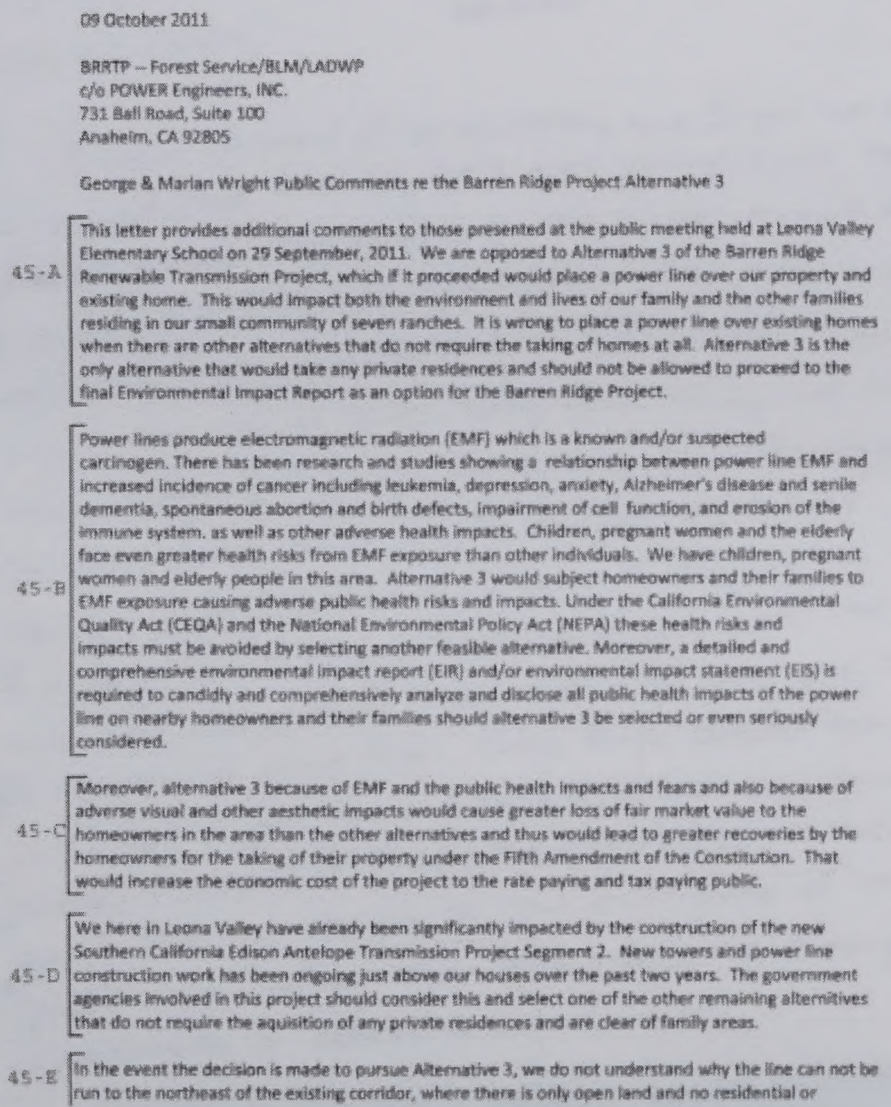
Response 44-A: Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR). Also please refer to Response 2-A.

Response 44-B: The Green Valley Multi-Line Relocation Alternative was considered but eliminated from detailed analysis in the Final EIS/EIR because it did not have the potential to avoid or minimize environmental impacts as compared to the Proposed Action. There is no evidence that costs will be lower over time if LADWP moves the corridor farther to the west as proposed.

Response 44-C: The overwhelming consensus, expressed in multidisciplinary reviews of power line frequency (referred to as ELF or extremely low frequency) electric and magnetic field (EMF) research internationally, is that the epidemiologic evidence is insufficient to demonstrate a causal relationship between EMF and any health effect. These reviews include those made by the most recognized national and international health and research organizations: National Institute of Environmental Health Sciences (NIEHS 1998; NIEHS 1999), the Health Council of the Netherlands (HCN 2001; HCN 2004), the National Radiological Protection Board of Great Britain (NRPB 2001; NRPB 2004b), and the International Agency for Research on Cancer (IARC 2002). Therefore, moving the power lines for the reason of producing a positive health effect is not reasonable since there are no known health effects for power line frequency EMF.

Response 44-D: We do not expect the maintenance or outage procedures for maintenance would change with the positioning of the corridor on the west side of Green Valley. They would remain the same regardless of where the lines are located.

INDIVIDUAL COMMENT LETTER 45: WRIGHT, G. & M.



09 October 2011

BRRTP – Forest Service/BLM/LADWP
c/o POWER Engineers, INC.
731 Ball Road, Suite 100
Anaheim, CA 92805

George & Marian Wright Public Comments re the Barren Ridge Project Alternative 3

45-A This letter provides additional comments to those presented at the public meeting held at Leona Valley Elementary School on 29 September, 2011. We are opposed to Alternative 3 of the Barren Ridge Renewable Transmission Project, which if it proceeded would place a power line over our property and existing home. This would impact both the environment and lives of our family and the other families residing in our small community of seven ranches. It is wrong to place a power line over existing homes when there are other alternatives that do not require the taking of homes at all. Alternative 3 is the only alternative that would take any private residences and should not be allowed to proceed to the final Environmental Impact Report as an option for the Barren Ridge Project.

45-B Power lines produce electromagnetic radiation (EMF) which is a known and/or suspected carcinogen. There has been research and studies showing a relationship between power line EMF and increased incidence of cancer including leukemia, depression, anxiety, Alzheimer's disease and senile dementia, spontaneous abortion and birth defects, impairment of cell function, and erosion of the immune system. as well as other adverse health impacts. Children, pregnant women and the elderly face even greater health risks from EMF exposure than other individuals. We have children, pregnant women and elderly people in this area. Alternative 3 would subject homeowners and their families to EMF exposure causing adverse public health risks and impacts. Under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) these health risks and impacts must be avoided by selecting another feasible alternative. Moreover, a detailed and comprehensive environmental impact report (EIR) and/or environmental impact statement (EIS) is required to candidly and comprehensively analyze and disclose all public health impacts of the power line on nearby homeowners and their families should alternative 3 be selected or even seriously considered.

45-C Moreover, alternative 3 because of EMF and the public health impacts and fears and also because of adverse visual and other aesthetic impacts would cause greater loss of fair market value to the homeowners in the area than the other alternatives and thus would lead to greater recoveries by the homeowners for the taking of their property under the Fifth Amendment of the Constitution. That would increase the economic cost of the project to the rate paying and tax paying public.

45-D We here in Leona Valley have already been significantly impacted by the construction of the new Southern California Edison Antelope Transmission Project Segment 2. New towers and power line construction work has been ongoing just above our houses over the past two years. The government agencies involved in this project should consider this and select one of the other remaining alternitives that do not require the aquisition of any private residences and are clear of family areas.

45-E In the event the decision is made to pursue Alternative 3, we do not understand why the line can not be run to the northeast of the existing corridor, where there is only open land and no residential or

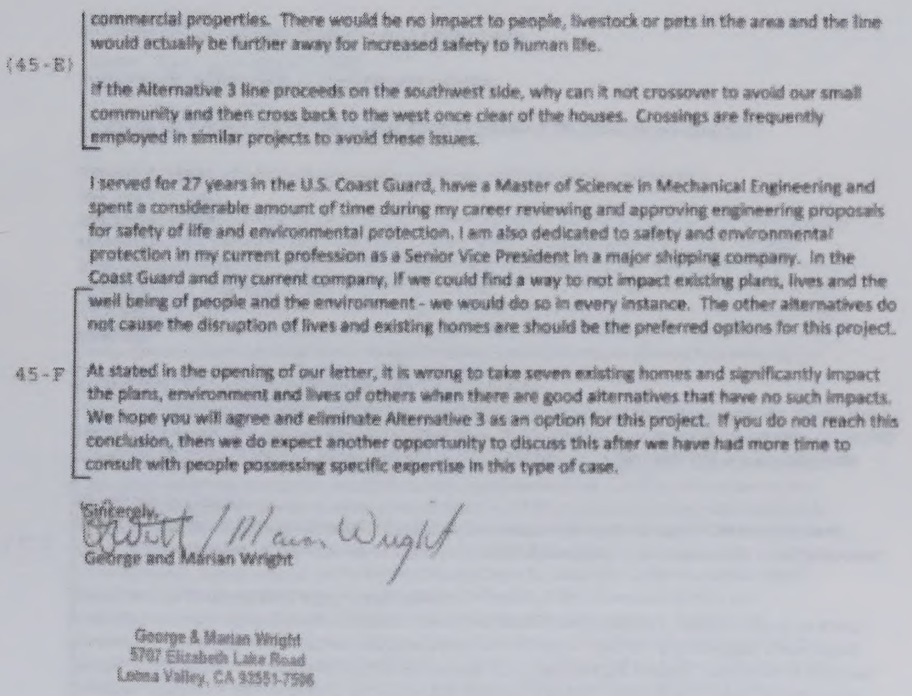
Response 45-A: Alternative 3 is not the Federal Agency Preferred Alternative, and we understand that your property and that of other private owners would be impacted if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative as described in Sections 2.7 and 2.8 of the Final EIS/EIR.

Response 45-B: Please refer to Section 3.2.12 in the Final EIS/EIR for a discussion of current international research findings regarding health effects of electric and magnetic fields (EMF). A detailed and comprehensive assessment of electrical effects impacts, including EMF, for each Project Alternative has been presented in Section 4.2.12 of the Final EIS/EIR.

Response 45-C: Alternative 3 is not the Federal Agency Preferred Alternative, and we understand that your property and that of other private owners would be impacted if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative.

Response 45-D: Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response 45-E: Crossing of existing lines is difficult and may result in reliability concerns for both transmission lines, but it is not impossible. Please note that Alternative 3 is not identified as the Federal Agency Preferred or Environmentally Superior Alternative as described in Sections 2.7 and 2.8 of the Final EIS/EIR. Your comments will be considered in the decision-



(45-B) commercial properties. There would be no impact to people, livestock or pets in the area and the line would actually be further away for increased safety to human life.

If the Alternative 3 line proceeds on the southwest side, why can it not crossover to avoid our small community and then cross back to the west once clear of the houses. Crossings are frequently employed in similar projects to avoid these issues.

I served for 27 years in the U.S. Coast Guard, have a Master of Science in Mechanical Engineering and spent a considerable amount of time during my career reviewing and approving engineering proposals for safety of life and environmental protection. I am also dedicated to safety and environmental protection in my current profession as a Senior Vice President in a major shipping company. In the Coast Guard and my current company, If we could find a way to not impact existing plans, lives and the well being of people and the environment - we would do so in every instance. The other alternatives do not cause the disruption of lives and existing homes are should be the preferred options for this project.

45-F At stated in the opening of our letter, it is wrong to take seven existing homes and significantly impact the plans, environment and lives of others when there are good alternatives that have no such impacts. We hope you will agree and eliminate Alternative 3 as an option for this project. If you do not reach this conclusion, then we do expect another opportunity to discuss this after we have had more time to consult with people possessing specific expertise in this type of case.

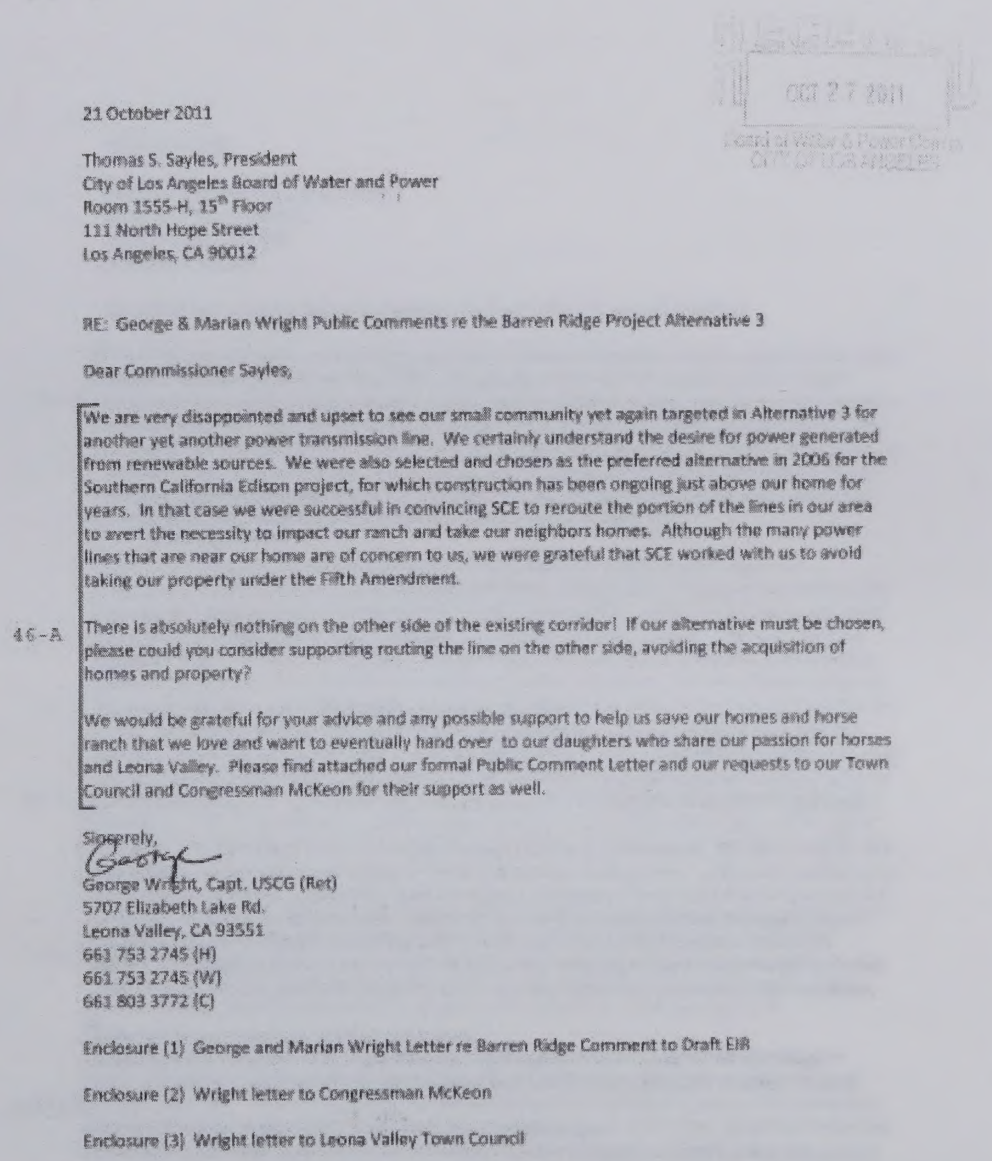
Sincerely,

George and Marian Wright

George & Marian Wright
5707 Elizabeth Lake Road
Leona Valley, CA 93551-7596

making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

Response 45-F: As described in Sections 2.7 and 2.8 of the Final EIS/EIR, Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative. Your concern for the impacts to private lands will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.



OCT 27 2011
Board of Water & Power Comm's
CITY OF LOS ANGELES

21 October 2011

Thomas S. Sayles, President
City of Los Angeles Board of Water and Power
Room 1555-H, 15th Floor
111 North Hope Street
Los Angeles, CA 90012

RE: George & Marian Wright Public Comments re the Barren Ridge Project Alternative 3

Dear Commissioner Sayles,

We are very disappointed and upset to see our small community yet again targeted in Alternative 3 for another yet another power transmission line. We certainly understand the desire for power generated from renewable sources. We were also selected and chosen as the preferred alternative in 2006 for the Southern California Edison project, for which construction has been ongoing just above our home for years. In that case we were successful in convincing SCE to reroute the portion of the lines in our area to avert the necessity to impact our ranch and take our neighbors homes. Although the many power lines that are near our home are of concern to us, we were grateful that SCE worked with us to avoid taking our property under the Fifth Amendment.

46-A There is absolutely nothing on the other side of the existing corridor! If our alternative must be chosen, please could you consider supporting routing the line on the other side, avoiding the acquisition of homes and property?

We would be grateful for your advice and any possible support to help us save our homes and horse ranch that we love and want to eventually hand over to our daughters who share our passion for horses and Leona Valley. Please find attached our formal Public Comment Letter and our requests to our Town Council and Congressman McKeon for their support as well.

Sincerely,
George
George Wright, Capt. USCG (Ret)
5707 Elizabeth Lake Rd.
Leona Valley, CA 93551
661 753 2745 (H)
661 753 2745 (W)
661 803 3772 (C)

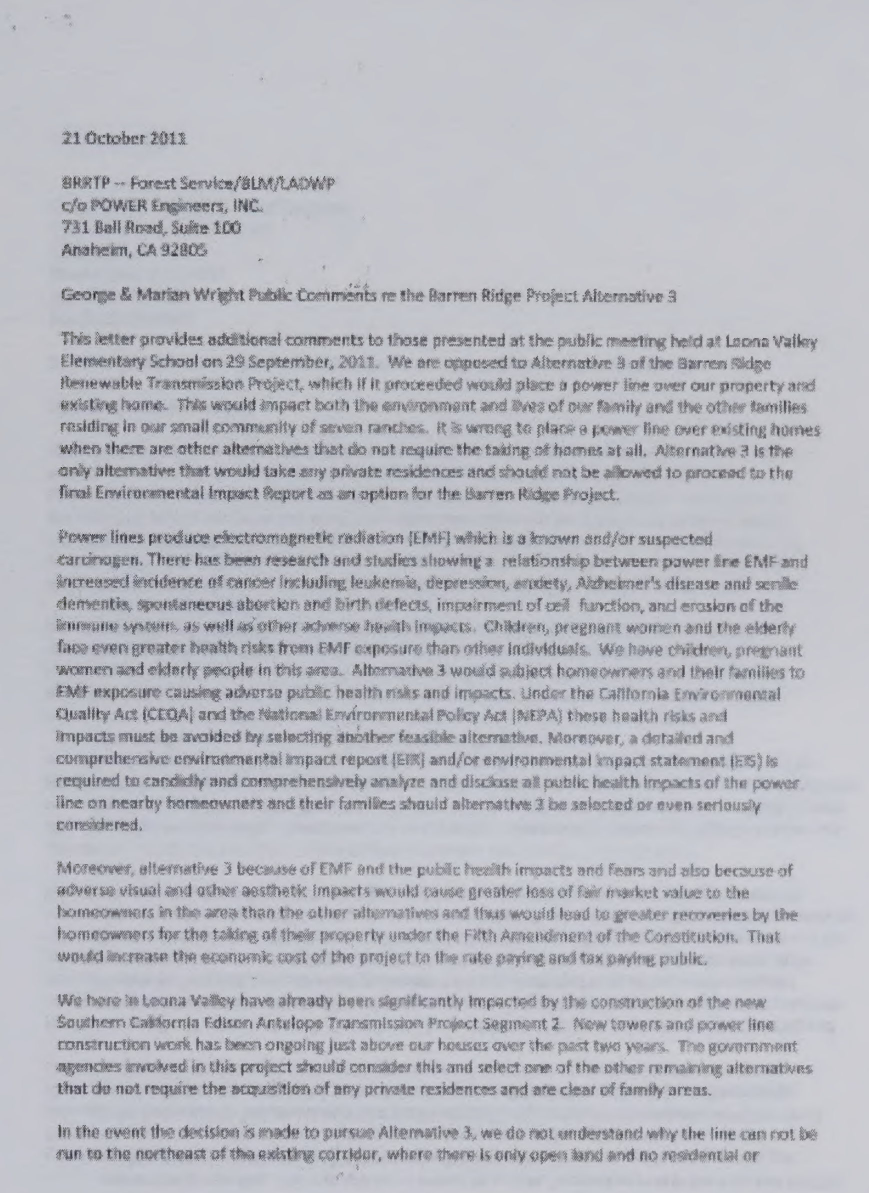
Enclosure (1) George and Marian Wright Letter re Barren Ridge Comment to Draft EIR

Enclosure (2) Wright letter to Congressman McKeon

Enclosure (3) Wright letter to Leona Valley Town Council

INDIVIDUAL COMMENT LETTER 46: WRIGHT, G.

Response 46-A: Alternative 3 is not identified as the Federal Agency Preferred or Environmentally Superior Alternative, as described in Sections 2.7 and 2.8 of the Final EIS/EIR, and we understand that your property and that of other private owners would be impacted if Alternative 3 were selected. It is for these reasons and others that Alternative 3 is not the Federal Agency Preferred or Environmentally Superior Alternative.



21 October 2011

BRRTP -- Forest Service/BLM/LADWP
c/o POWER Engineers, INC.
731 Ball Road, Suite 100
Anaheim, CA 92805

George & Marian Wright Public Comments re the Barren Ridge Project Alternative 3

This letter provides additional comments to those presented at the public meeting held at Leona Valley Elementary School on 29 September, 2011. We are opposed to Alternative 3 of the Barren Ridge Renewable Transmission Project, which if it proceeded would place a power line over our property and existing home. This would impact both the environment and lives of our family and the other families residing in our small community of seven ranches. It is wrong to place a power line over existing homes when there are other alternatives that do not require the taking of homes at all. Alternative 3 is the only alternative that would take any private residences and should not be allowed to proceed to the final Environmental Impact Report as an option for the Barren Ridge Project.

Power lines produce electromagnetic radiation (EMF) which is a known and/or suspected carcinogen. There has been research and studies showing a relationship between power line EMF and increased incidence of cancer including leukemia, depression, anxiety, Alzheimer's disease and senile dementia, spontaneous abortion and birth defects, impairment of cell function, and erosion of the immune system. as well as other adverse health impacts. Children, pregnant women and the elderly face even greater health risks from EMF exposure than other individuals. We have children, pregnant women and elderly people in this area. Alternative 3 would subject homeowners and their families to EMF exposure causing adverse public health risks and impacts. Under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) these health risks and impacts must be avoided by selecting another feasible alternative. Moreover, a detailed and comprehensive environmental impact report (EIR) and/or environmental impact statement (EIS) is required to candidly and comprehensively analyze and disclose all public health impacts of the power line on nearby homeowners and their families should alternative 3 be selected or even seriously considered.

Moreover, alternative 3 because of EMF and the public health impacts and fears and also because of adverse visual and other aesthetic impacts would cause greater loss of fair market value to the homeowners in the area than the other alternatives and thus would lead to greater recoveries by the homeowners for the taking of their property under the Fifth Amendment of the Constitution. That would increase the economic cost of the project to the rate paying and tax paying public.

We here in Leona Valley have already been significantly impacted by the construction of the new Southern California Edison Antelope Transmission Project Segment 2. New towers and power line construction work has been ongoing just above our houses over the past two years. The government agencies involved in this project should consider this and select one of the other remaining alternatives that do not require the acquisition of any private residences and are clear of family areas.

In the event the decision is made to pursue Alternative 3, we do not understand why the line can not be run to the northeast of the existing corridor, where there is only open land and no residential or

Enclosure 1.

commercial properties. There would be no impact to people, livestock or pets in the area and the line would actually be further away for increased safety to human life.

If the Alternative 3 line proceeds on the southwest side, why can it not crossover to avoid our small community and then cross back to the west once clear of the houses. Crossings are frequently employed in similar projects to avoid these issues.

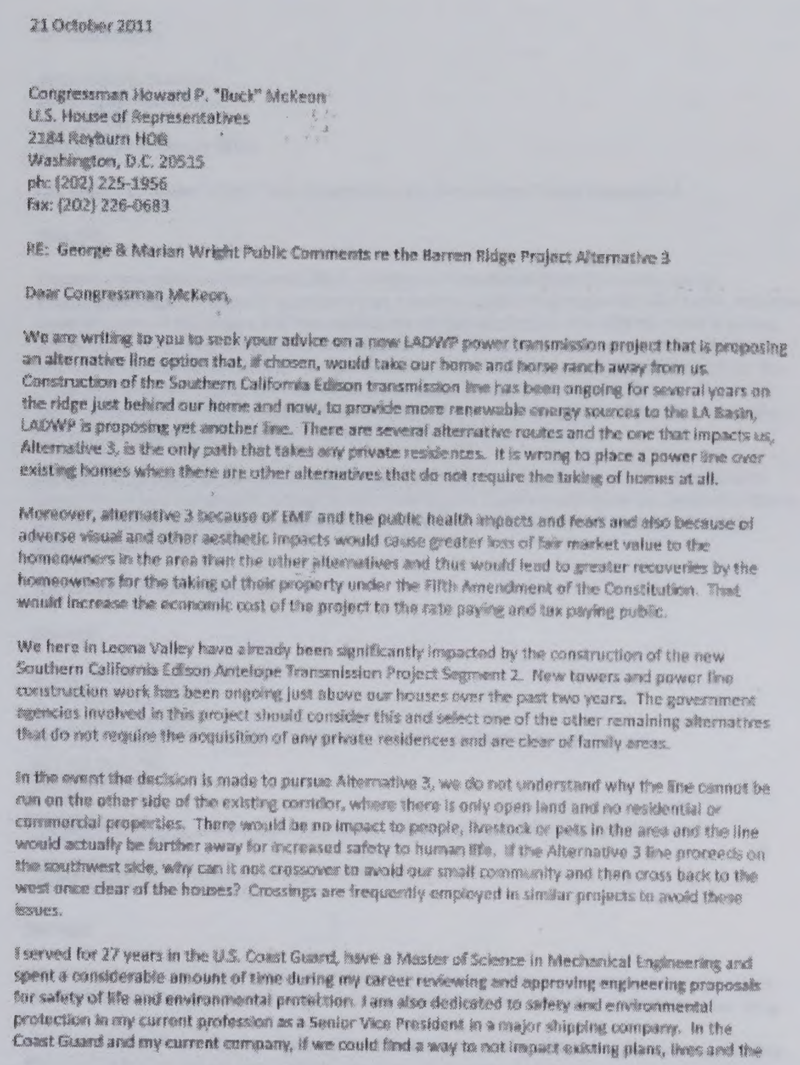
I served for 27 years in the U.S. Coast Guard, have a Master of Science in Mechanical Engineering and spent a considerable amount of time during my career reviewing and approving engineering proposals for safety of life and environmental protection. I am also dedicated to safety and environmental protection in my current profession as a Senior Vice President in a major shipping company. In the Coast Guard and my current company, if we could find a way to not impact existing plans, lives and the well being of people and the environment - we would do so in every instance. The other alternatives do not cause the disruption of lives and existing homes and should be the preferred options for this project.

At stated in the opening of our letter, it is wrong to take seven existing homes and significantly impact the plans, environment and lives of others when there are good alternatives that have no such impacts. We hope you will agree and eliminate Alternative 3 as an option for this project. If you do not reach this conclusion, then we do expect another opportunity to discuss this after we have had more time to consult with people possessing specific expertise in this type of case.

Sincerely,

George and Marian Wright
5707 Elizabeth Lake Rd.
Leona Valley, CA 93551
661 753 2745 (H)
661 753 2745 (W)
661 803 3772 (C)

Enclosure 2.



21 October 2011

Congressman Howard P. "Buck" McKeon
U.S. House of Representatives
2184 Rayburn HOB
Washington, D.C. 20515
ph: (202) 225-1956
fax: (202) 226-0683

RE: George & Marian Wright Public Comments re the Barren Ridge Project Alternative 3

Dear Congressman McKeon,

We are writing to you to seek your advice on a new LADWP power transmission project that is proposing an alternative line option that, if chosen, would take our home and horse ranch away from us. Construction of the Southern California Edison transmission line has been ongoing for several years on the ridge just behind our home and now, to provide more renewable energy sources to the LA Basin, LADWP is proposing yet another line. There are several alternative routes and the one that impacts us, Alternative 3, is the only path that takes any private residences. It is wrong to place a power line over existing homes when there are other alternatives that do not require the taking of homes at all.

Moreover, alternative 3 because of EMF and the public health impacts and fears and also because of adverse visual and other aesthetic impacts would cause greater loss of fair market value to the homeowners in the area than the other alternatives and thus would lead to greater recoveries by the homeowners for the taking of their property under the Fifth Amendment of the Constitution. That would increase the economic cost of the project to the rate paying and tax paying public.

We here in Leona Valley have already been significantly impacted by the construction of the new Southern California Edison Antelope Transmission Project Segment 2. New towers and power line construction work has been ongoing just above our houses over the past two years. The government agencies involved in this project should consider this and select one of the other remaining alternatives that do not require the acquisition of any private residences and are clear of family areas.

In the event the decision is made to pursue Alternative 3, we do not understand why the line cannot be run on the other side of the existing corridor, where there is only open land and no residential or commercial properties. There would be no impact to people, livestock or pets in the area and the line would actually be further away for increased safety to human life. If the Alternative 3 line proceeds on the southwest side, why can it not crossover to avoid our small community and then cross back to the west once clear of the houses? Crossings are frequently employed in similar projects to avoid these issues.

I served for 27 years in the U.S. Coast Guard, have a Master of Science in Mechanical Engineering and spent a considerable amount of time during my career reviewing and approving engineering proposals for safety of life and environmental protection. I am also dedicated to safety and environmental protection in my current profession as a Senior Vice President in a major shipping company. In the Coast Guard and my current company, if we could find a way to not impact existing plans, lives and the well being of people and the environment - we would do so in every instance. The other alternatives do not cause the disruption of lives and existing homes and should he the preferred options for this project.

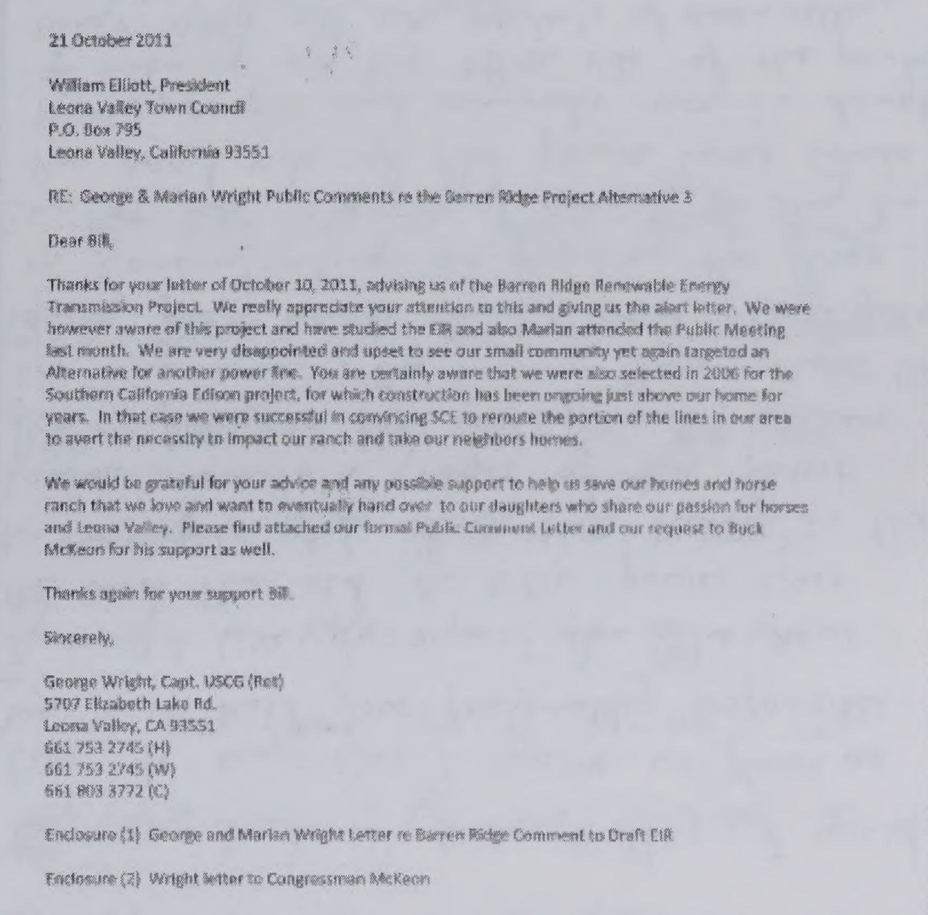
We would be grateful for any support you can provide to assist us in keeping our home and horse ranch that we love and want to pass on to our daughters who share our passion for horses and Leona Valley.

Sincerely,

George Wright, Capt. USCG (Ret)
5707 Elizabeth Lake Rd.
Leona Valley, CA 93551
661 753 2745 (H)
661 753 2745 (W)
661 803 3772 (C)

Enclosure (1) George and Marian Wright Letter re Barren Ridge Comment to Draft EIR

Enclosure 3.



21 October 2011

William Elliott, President
Leona Valley Town Council
P.O. Box 795
Leona Valley, California 93551

RE: George & Marian Wright Public Comments re the Barren Ridge Project Alternative 3

Dear Bill,

Thanks for your letter of October 10, 2011, advising us of the Barren Ridge Renewable Energy Transmission Project. We really appreciate your attention to this and giving us the alert letter. We were however aware of this project and have studied the EIR and also Marian attended the Public Meeting last month. We are very disappointed and upset to see our small community yet again targeted an Alternative for another power line. You are certainly aware that we were also selected in 2006 for the Southern California Edison project, for which construction has been ongoing just above our home for years. In that case we were successful in convincing SCE to reroute the portion of the lines in our area to avert the necessity to impact our ranch and take our neighbors homes.

We would be grateful for your advice and any possible support to help us save our homes and horse ranch that we love and want to eventually hand over to our daughters who share our passion for horses and Leona Valley. Please find attached our formal Public Comment Letter and our request to Buck McKeon for his support as well.

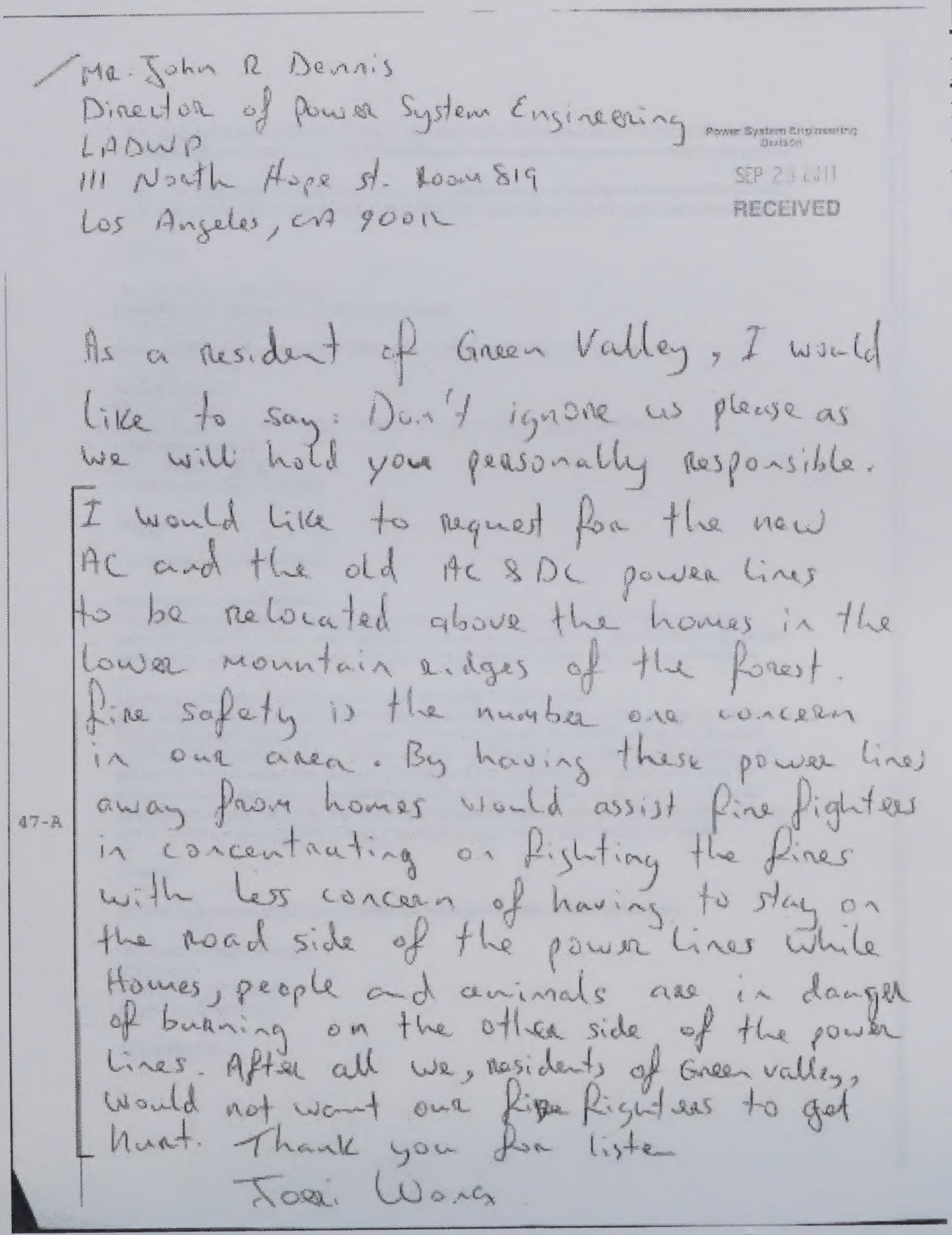
Thanks again for your support Bill.

Sincerely,

George Wright, Capt. USCG (Ret)
5707 Elizabeth Lake Rd.
Leona Valley, CA 93551
661 753 2745 (H)
661 753 2745 (W)
661 803 3772 (C)

Enclosure (1) George and Marian Wright Letter re Barren Ridge Comment to Draft EIR

Enclosure (2) Wright letter to Congressman McKeon



Mr. John R Dennis
Director of Power System Engineering
LADWP
111 North Hope st. Room 819
Los Angeles, CA 90012

Power System Engineering Division
SEP 23 2011
RECEIVED

As a resident of Green Valley, I would like to say: Don't ignore us please as we will hold you personally responsible.

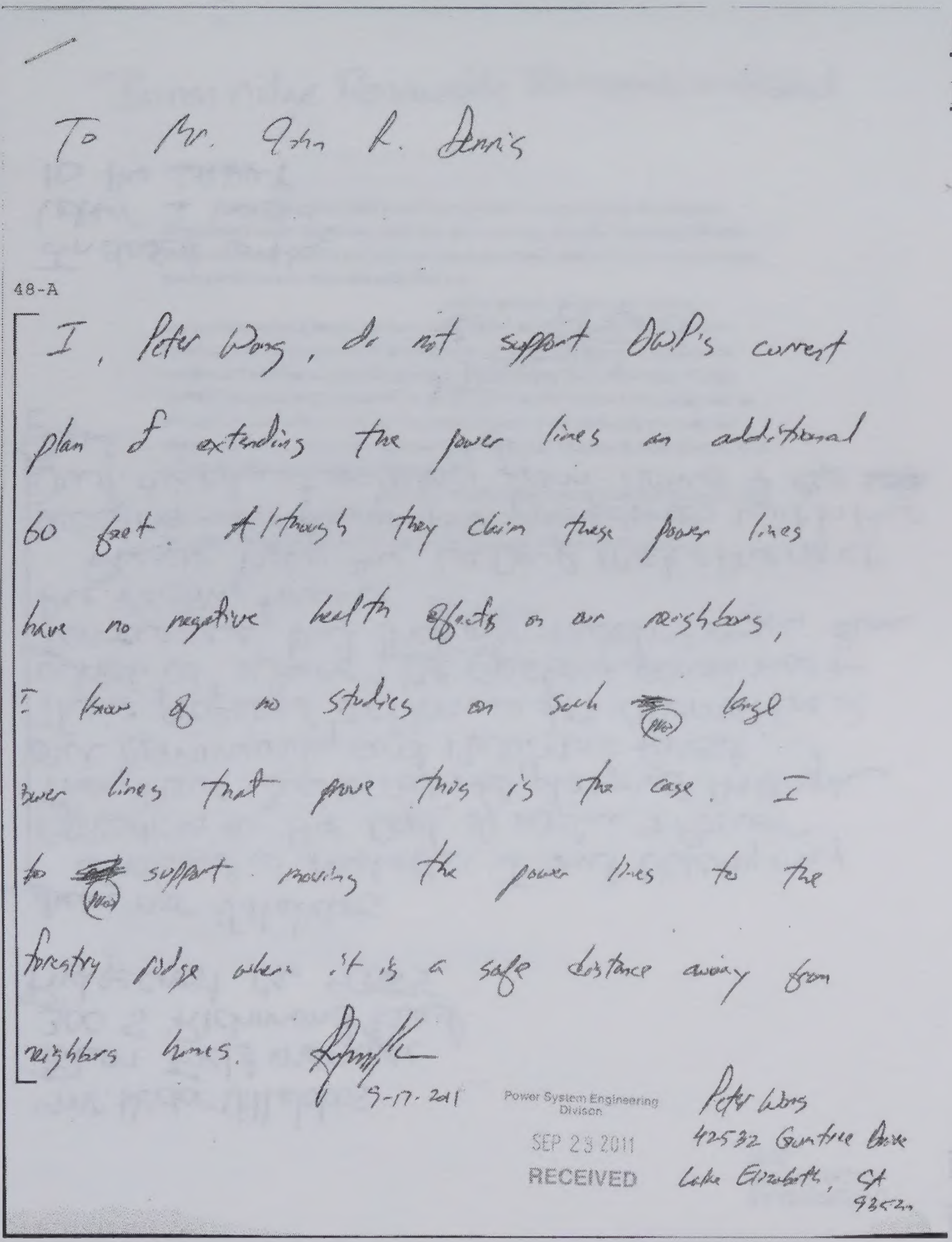
47-A I would like to request for the new AC and the old AC & DC power lines to be relocated above the homes in the lower mountain ridges of the forest. Fire safety is the number one concern in our area. By having these power lines away from homes would assist fire fighters in concentrating on fighting the fires with less concern of having to stay on the road side of the power lines while Homes, people and animals are in danger of burning on the other side of the power lines. After all we, residents of Green valley, would not want our ~~fire~~ fighters to get hurt. Thank you for liste

Jori Wong

INDIVIDUAL COMMENT LETTER 47: WONG, J.

Response 47-A: Please refer to Response 2-A. Safety of firefighters has been considered in the analysis and comparison of the Alternatives. Firefighting would not be significantly affected by the Proposed Action's taller towers (refer to Section 4.2.11 of the Final EIS/EIR).

INDIVIDUAL COMMENT LETTER 48: WONG, P.



To Mr. John R. Dennis

48-A

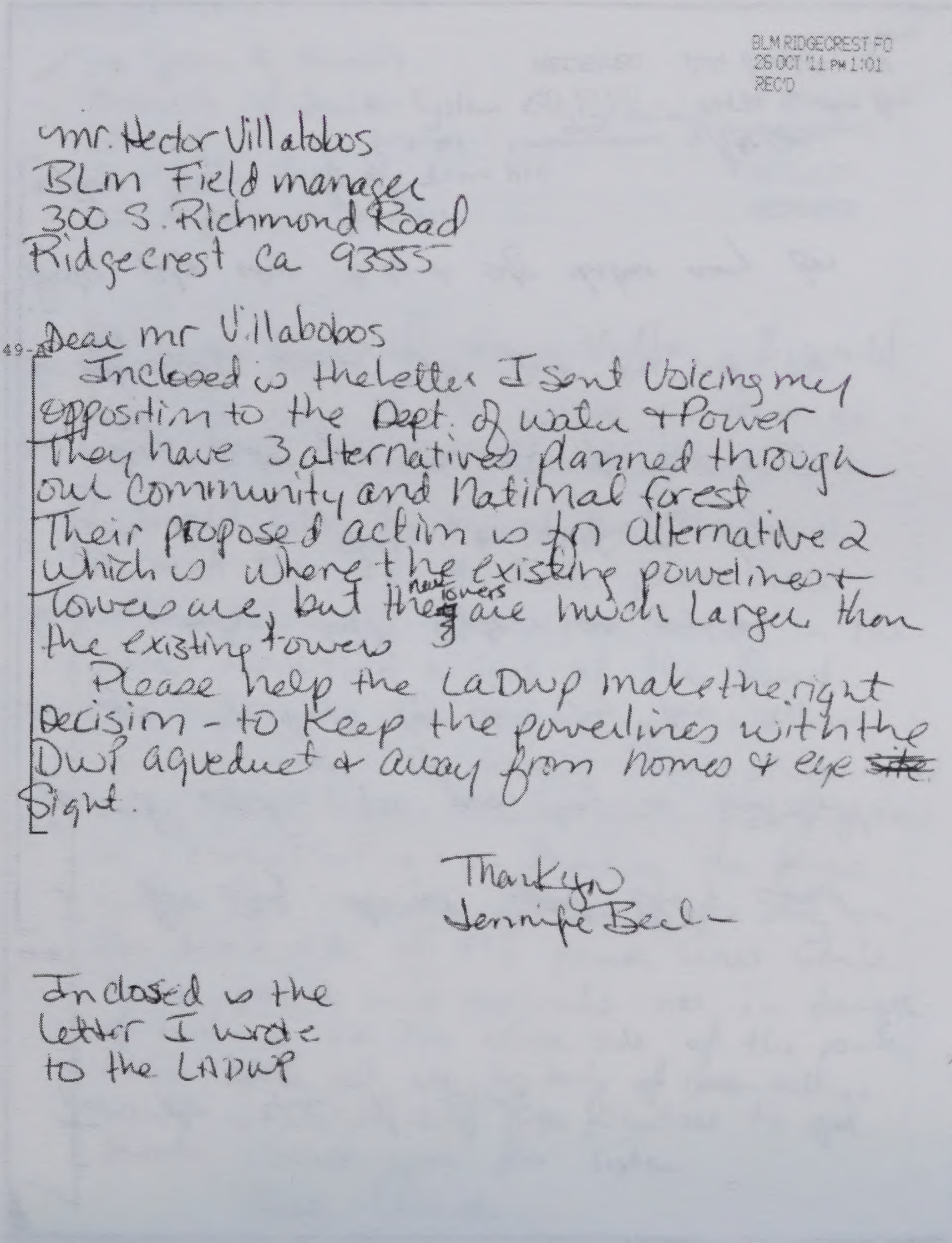
I, Peter Wong, do not support DWP's current plan of extending the power lines an additional 60 feet. Although they claim these power lines have no negative health effects on our neighbors, I know of no studies on such large power lines that prove this is the case. I do support moving the power lines to the forestry ridge where it is a safe distance away from neighbors homes.

9-17-2011

Power System Engineering Divison
SEP 23 2011
RECEIVED

Peter Wong
42532 Gumtree Drive
Lake Elizabeth, CA
93532

Response 48-A: Please refer to Response 2-A.



BLM RIDGECREST FO
26 OCT '11 PM 1:01
REC'D

mr. Hector Villalobos
BLM Field manager
300 S. Richmond Road
Ridgecrest Ca 93555

49-A Dear mr Villabobos

Inclosed is the letter I sent Voicing my opposition to the Dept. of water & Power They have 3 alternatives planned through our Community and National forest Their proposed action is for alternative 2 which is where the existing powerlines & Towers are, but the new towers are much larger than the existing towers

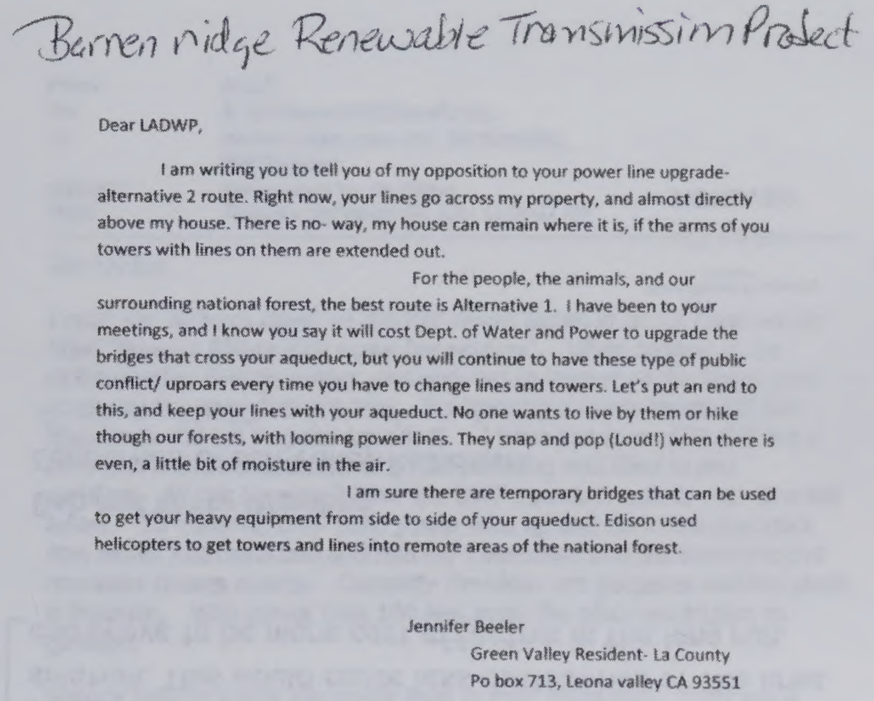
Please help the LADWP make the right decision - to Keep the powerlines with the DWP aqueduct & away from homes & eye ~~site~~ Sight.

Thank you
Jennifer Beel

Inclosed is the letter I wrote to the LADWP

INDIVIDUAL COMMENT LETTER 49: BEELER, J.

Response 49-A: Please refer to Response 2-A.



Barren ridge Renewable Transmissim Project

Dear LADWP,

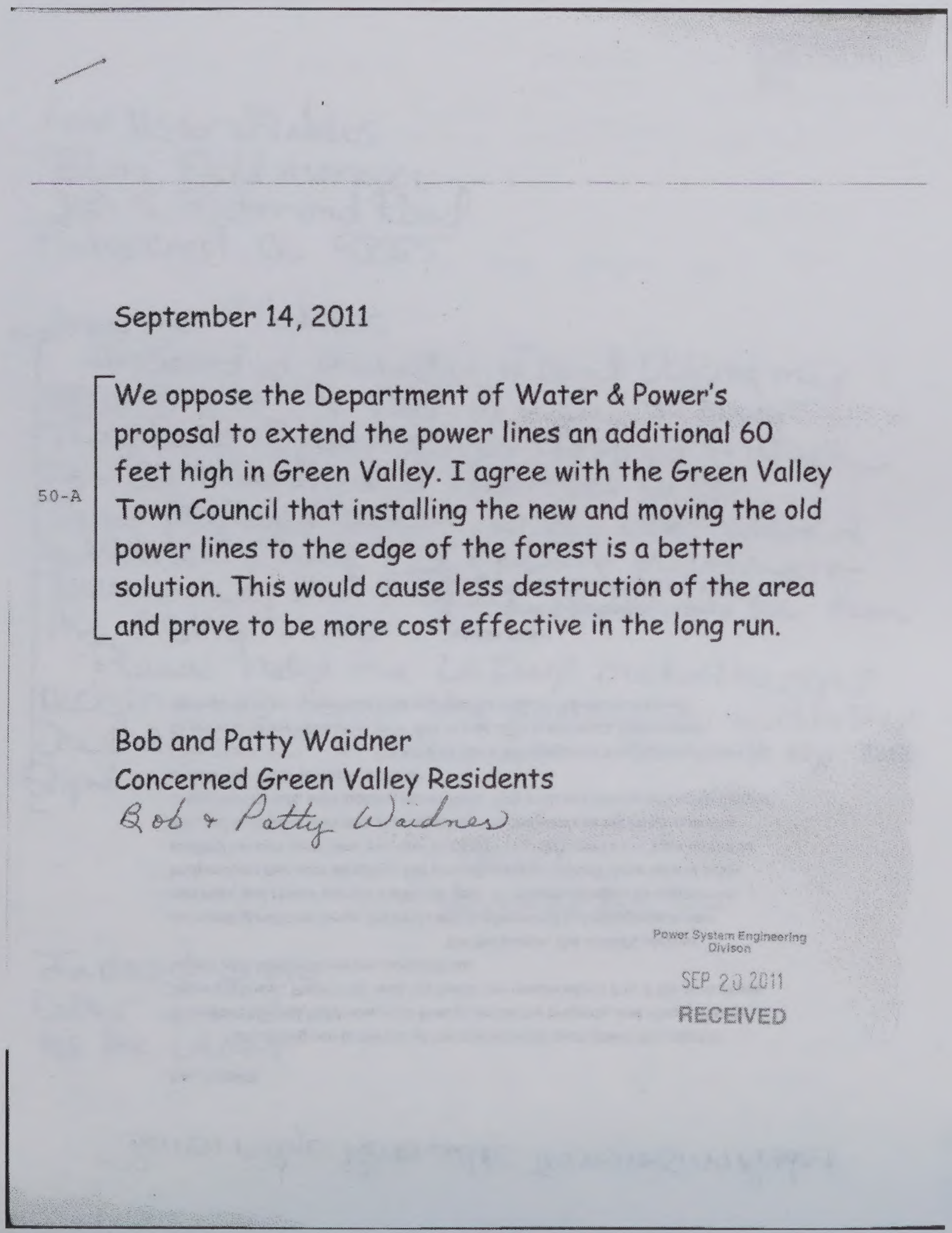
I am writing you to tell you of my opposition to your power line upgrade- alternative 2 route. Right now, your lines go across my property, and almost directly above my house. There is no- way, my house can remain where it is, if the arms of you towers with lines on them are extended out.

For the people, the animals, and our surrounding national forest, the best route is Alternative 1. I have been to your meetings, and I know you say it will cost Dept. of Water and Power to upgrade the bridges that cross your aqueduct, but you will continue to have these type of public conflict/ uproars every time you have to change lines and towers. Let's put an end to this, and keep your lines with your aqueduct. No one wants to live by them or hike though our forests, with looming power lines. They snap and pop (Loud!) when there is even, a little bit of moisture in the air.

I am sure there are temporary bridges that can be used to get your heavy equipment from side to side of your aqueduct. Edison used helicopters to get towers and lines into remote areas of the national forest.

Jennifer Beeler
Green Valley Resident- La County
Po box 713, Leona valley CA 93551

INDIVIDUAL COMMENT LETTER 50: WAIDNER B. & P.



September 14, 2011

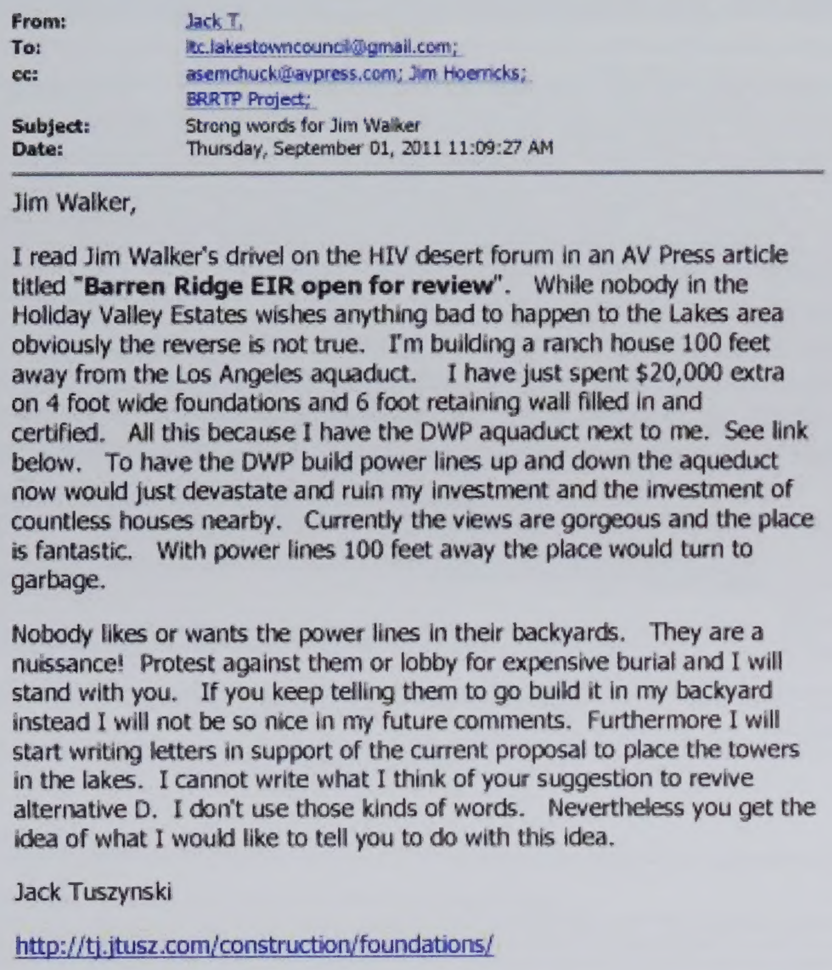
50-A We oppose the Department of Water & Power's proposal to extend the power lines an additional 60 feet high in Green Valley. I agree with the Green Valley Town Council that installing the new and moving the old power lines to the edge of the forest is a better solution. This would cause less destruction of the area and prove to be more cost effective in the long run.

Bob and Patty Waidner
Concerned Green Valley Residents
Bob & Patty Waidner

Power System Engineering
Divison
SEP 20 2011
RECEIVED

Response 50-A: Please refer to Response 2-A.

EMAIL COMMENT 1: TUSZYNSKI, J.



From: Jack T.
To: ltc.lakestowncouncil@gmail.com;
cc: asemchuck@avpress.com; Jim Hoernicks; BRRTP Project;
Subject: Strong words for Jim Walker
Date: Thursday, September 01, 2011 11:09:27 AM

Jim Walker,

I read Jim Walker's drivel on the HIV desert forum in an AV Press article titled "**Barren Ridge EIR open for review**". While nobody in the Holiday Valley Estates wishes anything bad to happen to the Lakes area obviously the reverse is not true. I'm building a ranch house 100 feet away from the Los Angeles aquaduct. I have just spent $20,000 extra on 4 foot wide foundations and 6 foot retaining wall filled in and certified. All this because I have the DWP aquaduct next to me. See link below. To have the DWP build power lines up and down the aqueduct now would just devastate and ruin my investment and the investment of countless houses nearby. Currently the views are gorgeous and the place is fantastic. With power lines 100 feet away the place would turn to garbage.

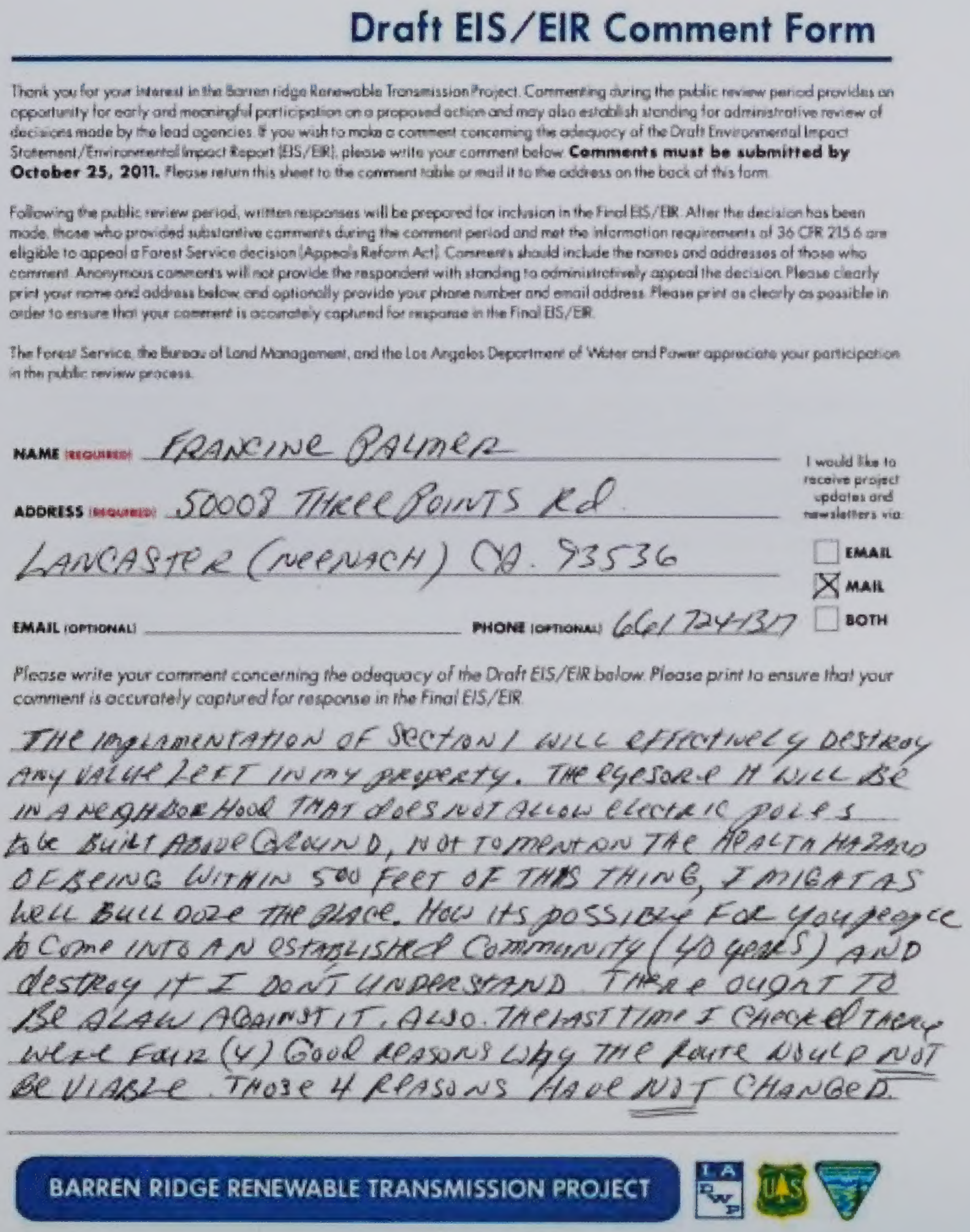
Nobody likes or wants the power lines in their backyards. They are a nuissance! Protest against them or lobby for expensive burial and I will stand with you. If you keep telling them to go build it in my backyard instead I will not be so nice in my future comments. Furthermore I will start writing letters in support of the current proposal to place the towers in the lakes. I cannot write what I think of your suggestion to revive alternative D. I don't use those kinds of words. Nevertheless you get the idea of what I would like to tell you to do with this idea.

Jack Tuszynski

http://tj.jtusz.com/construction/foundations/

Email Response 1: The potential visual impacts of the Proposed Action and Alternatives are described in the Final EIS/EIR in Section 4.2.9, and the potential land use impacts are described in Section 4.2.3. Potential impacts to property values are discussed under Socioeconomics in Section 4.2.13 of the Final EIS/EIR. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

COMMENT FORM 1: PALMER, F.



Draft EIS/EIR Comment Form

Thank you for your interest in the Barren ridge Renewable Transmission Project. Commenting during the public review period provides an opportunity for early and meaningful participation on a proposed action and may also establish standing for administrative review of decisions made by the lead agencies. If you wish to make a comment concerning the adequacy of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), please write your comment below. **Comments must be submitted by October 25, 2011.** Please return this sheet to the comment table or mail it to the address on the back of this form.

Following the public review period, written responses will be prepared for inclusion in the Final EIS/EIR. After the decision has been made, those who provided substantive comments during the comment period and met the information requirements of 36 CFR 215.6 are eligible to appeal a Forest Service decision (Appeals Reform Act). Comments should include the names and addresses of those who comment. Anonymous comments will not provide the respondent with standing to administratively appeal the decision. Please clearly print your name and address below and optionally provide your phone number and email address. Please print as clearly as possible in order to ensure that your comment is accurately captured for response in the Final EIS/EIR.

The Forest Service, the Bureau of Land Management, and the Los Angeles Department of Water and Power appreciate your participation in the public review process.

NAME (REQUIRED) FRANCINE PALMER

ADDRESS (REQUIRED) 50008 THREE POINTS Rd
LANCASTER (NEENACH) CA. 93536

EMAIL (OPTIONAL)

PHONE (OPTIONAL) 661 724-1317

I would like to receive project updates and newsletters via:
☐ **EMAIL**
☒ **MAIL**
☐ **BOTH**

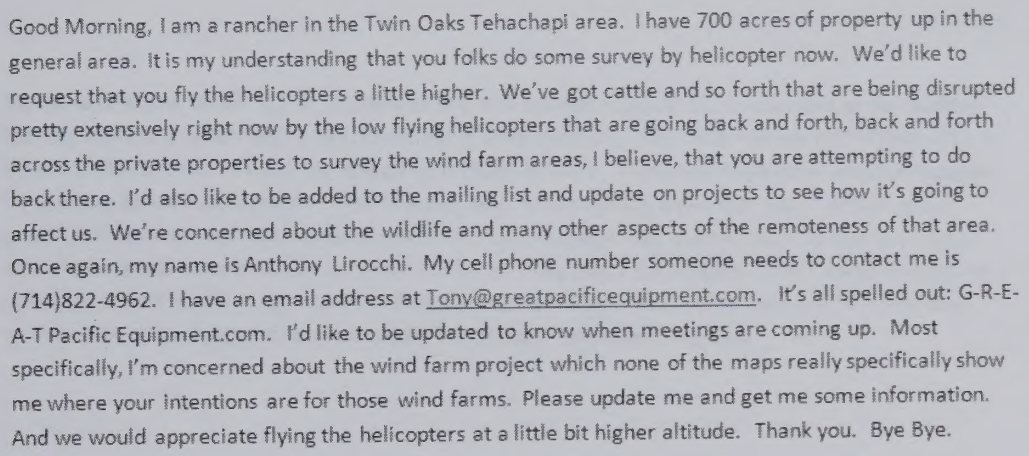
Please write your comment concerning the adequacy of the Draft EIS/EIR below. Please print to ensure that your comment is accurately captured for response in the Final EIS/EIR.

THE IMPLAMENTATION OF SECTION 1 WILL EFFECTIVELY DESTROY ANY VALUE LEFT IN MY PROPERTY. THE EYESORE IT WILL BE IN A NEIGHBORHOOD THAT DOES NOT ALLOW ELECTRIC POLES to be BUILT ABOVE GROUND, NOT TO MENTION THE HEALTH HAZARD OF BEING WITHIN 500 FEET OF THIS THING, I MIGHT AS well BULLDOZE THE PLACE. HOW ITS POSSIBLE FOR YOU PEOPLE to COME INTO AN ESTABLISHED COMMUNITY (40 YEARS) AND destroy it I DONT UNDERSTAND. THERE OUGHT TO BE A LAW AGAINST IT. ALSO. THE LAST TIME I CHECKED THERE WERE FOUR (4) GOOD REASONS WHY THE ROUTE WOULD NOT BE VIABLE. THOSE 4 REASONS HAVE NOT CHANGED.

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT

Comment Form Response 1: Alternative 1 is not identified as the Federal Agency or Environmentally Superior Alternative as described in Sections 2.7 and 2.8 of the Final EIS/EIR. It is for overall greater magnitude of potential impacts associated with Alternative 1 that it is not the Preferred Alternative. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

HOTLINE COMMENT 1: LIROCCHI, T.


Good Morning, I am a rancher in the Twin Oaks Tehachapi area. I have 700 acres of property up in the general area. It is my understanding that you folks do some survey by helicopter now. We'd like to request that you fly the helicopters a little higher. We've got cattle and so forth that are being disrupted pretty extensively right now by the low flying helicopters that are going back and forth, back and forth across the private properties to survey the wind farm areas, I believe, that you are attempting to do back there. I'd also like to be added to the mailing list and update on projects to see how it's going to affect us. We're concerned about the wildlife and many other aspects of the remoteness of that area. Once again, my name is Anthony Lirocchi. My cell phone number someone needs to contact me is (714)822-4962. I have an email address at Tony@greatpacificequipment.com. It's all spelled out: G-R-E-A-T Pacific Equipment.com. I'd like to be updated to know when meetings are coming up. Most specifically, I'm concerned about the wind farm project which none of the maps really specifically show me where your intentions are for those wind farms. Please update me and get me some information. And we would appreciate flying the helicopters at a little bit higher altitude. Thank you. Bye Bye.

Hotline Comment Response 1: We have added your contact information to the Project mailing list to provide you with information regarding upcoming meetings and Project milestones. The Barren Ridge Renewable Transmission Project is not directly associated with any specific proposed or future wind energy projects. Your request for higher helicopter overflight heights has been forwarded to the lead agencies.

Laura Loya. (661)674-9976 of Elizabeth Lake. You know we could have all the turbines out here in all those rich areas of Marina Del Rey, Malibu, along the beach line, and nobody would see them and that has more wind than we get. And shame on DWP for wanting to mess up our beautiful little country area, one of the few left in the United States, just for those people in LA and we get nothing from it and we have to look at all those ugly big wind turbines. We don't want to be another Palm Springs, and that is how I feel about it, and that is how everyone I talked to feels about it. Shame on all you power companies who take advantage of the little towns.

HOTLINE COMMENT 2: LOYA, L.

Hotline Comment Response 2: The Barren Ridge Renewable Transmission Project is not directly associated with any specific proposed or future wind energy projects.

HOTLINE COMMENT 3: MOORADIAN, W.

My name is Wayne W-A-Y-N-E Mooradian M-O-O-R-A-D-I-A-N. I would like to be added to the mailing list. My address is 10825 Silicon Ave. Montclair, California 91763. My office number is (714)590-4111 or my cell (714)330-3040. Excuse me, the office is (909)590-4111. I have some questions about mitigation for land use for off road vehicles. If we're losing land, which already we've lost over 7 million acres, [garbled] Protection Act. We really can't afford to lose anymore. We need to open up that 7.1 million acres because the desert tortoise isn't affected by us. They come out at night. They're predators of the raven, not the off roaders. We're not looking to run over turtles. So anyway, I need to be in the loop there so please send that information once it's available. Thank you. Bye Bye.

Hotline Comment Response 3: We have added your contact information to the Project mailing list to provide you with information regarding upcoming Project milestones, and your comment will be considered during the decision-making process. See Section 4.2.5, Recreation, of the Final EIS/EIR for a full discussion of potential off-highway vehicle (OHV) impacts for each Alternative. Project-related improvements of access restrictions that would result in a loss of recreational opportunities for OHV users would be less than significant and temporary in nature, occurring only during construction.

HOTLINE COMMENT 4: MONEDELMAN, M.

My name is Matt Monedelman and my phone number is (949)887-7566. I do have a land in the area which the project is going to be done. My concern is in the future plans for myself is the residential area that I would like to build in that area. So if my comment is important, I would like to select the align number 1 so it can be away from the residential area if possible. Transmission power line I don't' think is a good thing to have close to the residential area with all the radiation and all. So once again, my name is Matt Monedelman. Phone Number (949)887-7566. I do have land on that area. Thank you, bye.

Hotline Comment Response 4: The potential visual impacts of the Proposed Action and Alternatives are described in the Final EIS/EIR in Section 4.2.9, and the potential land use impacts are described in Section 4.2.3 of the Final EIS/EIR. Your comments will be considered in the decision-making processes prior to final decisions on the Proposed Action by the BLM, USFS, and LADWP.

APPENDIX S: MITIGATION MONITORING AND REPORTING PROGRAM

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The following Mitigation Monitoring and Reporting Program has been developed by the Los Angeles Department of Water and Power (LADWP) per the requirements of the California Environmental Quality Act (CEQA). It is not considered binding on the U.S. Department of Agriculture, Forest Service (USFS) or the U.S. Department of the Interior, Bureau of Land Management (BLM). The federal lead agencies will independently select the mitigation measures to be included in the Record of Decision for each agency.

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency*	Verification of Compliance		
				Initials	Date	Remarks
Air Quality and Climate Change						
AIR-2a	*Implement Construction Fugitive Dust Control Plan.* The construction contractor shall develop a Fugitive Dust Emission Control Plan for construction work. Measures to be incorporated into the plan include, but are not limited to, the following where practical: • Water the disturbed areas of the active construction sites in sufficient quantities to prevent the generation of visible dust plumes. Watering may not be required in wet weather. Soil binders may be used in lieu of watering where soil binders are appropriate and prevent the generation of visible dust plumes. • Enclose, cover, or apply water a minimum of twice daily to exposed piles with a five percent or greater silt content. • ARB-certified and agency-approved (on federal lands) non-toxic soil binders shall be applied per manufacturer recommendations to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction (as allowed by responsible agencies such as the USFS and BLM) to reduce fugitive dust emissions. Other watering products, selected from lists available from the Environmental Protection Agency's (EPA's) Environmental Technology Verification program or the SCAQMD, may be applied per manufacturer recommendations in place of the ARB-certified soil binders if such products can be reasonably demonstrated to be as effective as the ARB-certified non-toxic soil binders and be approved by the affected federal agency. • Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8-hour work day]; OR Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour. Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface, to reduce fugitive dust emissions. • All vehicle tires shall be inspected, are to be free of dirt, and washed as necessary before entering paved roadways. In lieu of washing vehicle tires, the construction contractor may sweep roads on a regular basis or employ similar methods to reduce dust track-out. • Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit unpaved areas. • Cover all trucks hauling soil and other loose material, or require at least two feet of freeboard. • Establish a vegetative ground cover (in compliance with biological resources impact mitigation measures) as appropriate or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites after active construction operations have ceased. • Increase the frequency of watering unpaved surfaces under active construction to more than three times daily, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources as required by SCAQMD Rule 403 before wind events.) • Travel routes to each construction site shall be developed to minimize unpaved road travel. • Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions. • Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions. • Prevent spillage when hauling loose material by limiting speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 miles per hour.	During Construction	LADWP USFS BLM			
AIR-2b	**Properly Maintain Mechanical Equipment.** The construction contractor shall ensure that all mechanical equipment associated with Project construction is properly tuned and maintained in accordance with the manufacturer's specifications to the extent feasible, and is maintained to perform at CARB and/or EPA certification levels. The construction contractor shall prevent tampering with equipment. This measure will be verified by LADWP through unscheduled inspections.	During Construction	LADWP USFS BLM			
AIR-2c	**Use Ultra Low-sulfur Diesel Fuel**. ARB-certified ultra low-sulfur diesel (ULSD) fuel containing 15 ppm sulfur or less shall be used in all diesel-powered construction equipment to the extent feasible.	During Construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency*	Verification of Compliance		
				Initials	Date	Remarks
AIR-2d	**Restrict Diesel Engine Idling to Five Minutes.** In accordance with LADWP's Environmental Affairs Bulletin 2007-05 dated March 12, 2007, and in accordance with the requirements of the ARB's idling regulations, vehicles with a gross vehicle weight rating (GVWR) of greater than 10,000 pounds "shall not idle the vehicle's primary diesel engine for greater than five minutes at any location." This measure will be verified by LADWP through unscheduled inspections. The five-minute idling limit does not apply for the period during which: • Idling must occur due to traffic conditions. • Idling when the vehicle is queuing that at all times is more than 100 feet from any real property zoned for individual or multifamily housing units that has one or more such units on it. • Idling when forced to remain motionless due to immediate adverse weather conditions. • Idling to verify that the vehicle is in safe operating condition. • Idling is required for mandatory resting, servicing, repairing, or diagnostic purposes. • Idling when positioning or providing a power source for equipment or operations other than transporting passengers or propulsion. • Idling while operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency.	During Construction	LADWP USFS BLM			
AIR-2e	**Schedule Deliveries Outside of Peak Traffic Hours.** All material deliveries to the marshalling yards and from the marshalling yards to the construction sites shall be scheduled outside of peak traffic hours (6:00 to 9:30 a.m. and 3:30 to 6:30 p.m.) to the extent feasible, and other truck trips during peak traffic hours shall be minimized to the extent feasible. Construction scheduling will be planned to minimize vehicle trips.	During construction	LADWP			
AIR-2f	**Off-road Diesel-fueled Equipment Standards.** During project construction, all internal combustion engines/construction equipment operating on the project site shall meet EPA-Certified Tier 2 emissions standards, or higher according to the following: • January 1, 2012 to December 31, 2014: all offroad diesel-powered construction equipment greater than 50 hp shall meet Tier 3 offroad emissions standards. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. • Post-January 1, 2015: All offroad diesel-powered construction equipment greater than 50 hp shall meet the Tier 4 emission standards, where available. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. • A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. • Encourage construction contractors to apply for AQMD "SOON" funds. Incentives will be provided for those construction contractors who apply for AQMD "SOON" funds. The "SOON" program provides funds to accelerate clean up of offroad diesel vehicles, such as heavy duty construction equipment. • Alternative fuels such as natural gas and electricity shall be used where available and feasible. This measure will be implemented through development of administrative controls, including: • Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking; • Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and • Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which the construction contractor will minimize impacts to these populations (e.g., locate construction equipment and staging zones away from sensitive receptors and building air intakes). • Provide advanced notification to sensitive receptors of the potential effects of PM_{10} and $PM_{2.5}$, as well as toxic air contaminants, prior to construction.	Prior to and during construction	LADWP USFS BLM			
AIR-2g	**On-road Vehicles Standards.** All on-road construction vehicles shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.	During construction	LADWP			
AIR-2h	**Off-road Gasoline-fueled Equipment Standards.** All off-road stationary and portable gasoline powered equipment shall have EPA Phase 1/Phase 2 compliant engines, where the specific engine requirement shall be based on the new engine standard in effect two years before initiating Project construction.	Prior to construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency*	Verification of Compliance		
				Initials	Date	Remarks
AIR-4a	**General Conformity Offset Mitigation.** If the final emission estimate for the selected Project Alternative as provided in the Project's Conformity Analysis exceeds the NOx and/or VOC emission applicability thresholds, and assuming the SCAQMD does not provide confirmation that the Project's emissions are accounted for in the State Implementation Plan (SIP) emission estimates per 40 CFR 93.158(a)(1), then the Project will obtain emission reduction credits to fully offset the NOx and/or VOC emissions per 40 CFR 93.158(a)(2) for the years that the Project has been estimated to exceed the NOx and/or VOC emission applicability thresholds. Credits shall be submitted to the BLM and USFS for review and approval.	Prior to construction	LADWP USFS BLM			
Recreation						
R-1a	**Coordinate construction schedule and maintenance activities with managing officer(s) for affected recreation areas.** LADWP shall develop a Project construction schedule and coordinate construction with the authorized officer(s) or the agencies of recreational areas affected by construction and maintenance activities, including but not limited to the following: BLM, USFS (ANF); California Department of Fish and Game (CDFG); Pacific Crest Trail Association (PCTA); California State Park and Recreation Commission; California Department of Parks and Recreation; Kern County Department of Parks and Recreation; Castaic Lake Water Agency (CLWA); Mountains Recreation & Conservation Authority (MRCA); and Los Angeles County Department of Parks and Recreation. Through coordination efforts with the agencies listed above, as well as any additional agencies that manage recreational resources which would be affected, and at the discretion of the authorized officer(s) responsible for management of the affected resource(s), LADWP shall ensure the following occurs, to the extent practical, unless otherwise approved by the affected agencies: • Construction and maintenance activities are scheduled to avoid heavy recreational use periods (including major holidays); • Staging areas for Project-related equipment, materials, and vehicles are in areas with the least possible effect on recreational activities and opportunities; • Timetables for the required period of usage of each staging area are developed and adhered to in coordination with affected resource agencies.	Prior to and during construction	LADWP USFS BLM			
R-1b	**Identify and provide noticing of alternative recreation areas.** To the extent feasible, LADWP shall coordinate with the authorized recreation officer(s) or the agencies of all recreational areas affected by construction and maintenance activities, including but not limited to those listed under R-1a (Coordinate construction schedule and maintenance activities with managing officer[s] for affected recreation areas), the purpose of which is to accomplish the following: • Identify recreational areas (i.e., trails, parks, day-use areas) that would be closed during Project construction or maintenance activities; • To the extent feasible, identify alternative recreational areas for each resource that would be made unavailable to the public due to construction or maintenance activities; and • Post a public notice which identifies alternative recreational areas at USFS Ranger Stations within the ANF and at all recreational areas to be closed due to construction or maintenance activities.	Prior to and during construction	LADWP USFS			
R-1c	**Notification of temporary closure of Off-Highway Vehicle routes.** To the extent feasible, LADWP shall coordinate with the USFS (ANF) to identify OML 2 roads and other designated OHV routes which would be closed or otherwise made unavailable for use as a result of Project construction and maintenance activities. Included in this coordination effort, LADWP shall prepare a public notice which identifies all OML 2 roads and OHV routes to be closed as a result of construction and/or maintenance activities.	Prior to and during construction	LADWP USFS			
R-1d	**Notification of temporary closure and reroute of the Pacific Crest National Trail and/or other trails.** LADWP shall coordinate with the BLM, USFS, PCTA, and other agencies or organization(s) regarding temporary closure of trails that would occur during Project construction and maintenance activities. The following shall be included in this coordination effort to the extent feasible: • Identification of trail diversions to be applied at each point where trails would be temporarily closed to through-traffic as a result of construction and maintenance activities; and • Posting of public notices of temporary closures/diversions at locations determined to be appropriate by the agency or organization during construction and maintenance activities.	Prior to and during construction	LADWP UFS BLM			

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				Initials	Date	Remarks
R-1e	**Compensate ANF for reductions in Adventure Pass sales due to recreation area closures associated with the Project**. Before Project construction in the ANF, LADWP shall coordinate with the USFS (ANF) to identify recreational resources on NFS lands in the ANF that would be temporarily closed as a direct result of Project construction. A resource is only considered to be closed directly as a result of Project construction if the resource is made entirely inaccessible to the public as a sole result of Project activities. LADWP shall coordinate with the USFS in reviewing financial records of the Adventure Pass program as well as recreational use data for the ANF. Upon completion of this review, LADWP and USFS shall come to agreement on recreation enhancement projects that will mitigate for the temporary loss of recreation facilities and reduction in revenue, comparable to the direct impacts of the Project. These projects shall be carried out by LADWP, according to plans and specifications of the USFS. Projects do not necessarily have to occur at sites directly impacted by the Project, but shall remain commensurate with the agreed-upon Project impacts.	Prior to construction	LADWP USFS			
R-2	**Avoid permanent upgrades to National Forest System roads.** LADWP shall avoid the permanent upgrade of NFS roads to the extent feasible as a result of Project construction or operation and maintenance activities unless otherwise approved by the USFS. Road upgrades that are required to accommodate construction of the Project shall be temporary in nature. Following construction of the Project, existing OML standards designated for temporarily improved roads shall be adhered to, thereby returning improved roads to existing maintenance practices, unless otherwise authorized by the USFS. As determined to be necessary through coordination between LADWP and the USFS and at the discretion of the USFS, LADWP shall develop a plan for returning improved NFS roads to existing conditions. LADWP shall implement the restrictions for road improvements and maintenance set forth in the Special Use or Road Use Authorization to be issued by the USFS for the Project.	During construction and operation & maintenance	LADWP USFS			
R-3	**Installation of physical barriers.** LADWP would install physical barriers to prevent illegal OHV use to the extent feasible. LADWP will place and maintain barriers, such as boulders or rail fencing, during restoration of temporary work sites. In addition, LADWP would place gates at permanent LADWP roads where public use is not allowed.	During construction	LADWP USFS			
Public Services and Utilities Systems						
PSU-1	**Recycle Solid Construction Waste.** LADWP contractors shall recycle a portion of the solid waste generated during Project construction activities to the extent feasible. The quantity of Project waste that is recycled shall aide local jurisdictions in meeting and/or exceeding Assembly Bill 939 standards.	During construction	LADWP			
Hazardous Materials						
HAZ-1	**Environmental Monitoring Program.** A construction monitoring plan shall be enforced by LADWP and its contractors to ensure that provisions outlined in Project-specific plans are correctly followed for the duration of the construction period. Site-specific plans would include, but are not limited to, the Emergency Response Plan; Hazardous Materials/Waste Management Plan; SWPPP; Soil Management Plan; and the SPCC.	During construction	LADWP			
HAZ-2	**Document compliance with measures for encountering unknown contamination.** If evidence of soil or groundwater contamination is detectable by visual and/or olfactory observation during Project construction, a report documenting the exact contamination location, laboratory test results, actions taken, and recommended mitigation (if applicable) shall be submitted to the USFS (if on USFS lands) or BLM (if on BLM lands) for each incident. This report shall be submitted within 30 days of LADWP's receipt of laboratory results.	During construction	LADWP USFS BLM			
HAZ-4	**Herbicide Application Protocols.** **Protocol 1- Selection of Project Herbicides:** • Herbicides would be selected from an LADWP- and USFS-approved list, with mixture and dilution ratios that have been specified by the manufacturer. **Protocol 2- Contract Qualified Personnel for Herbicide Application:** • Individuals selected for herbicide application must possess all appropriate State and local herbicide applicator licenses, and documented training complying with applicable regulations and ordinances. • Supervisory personnel must be familiar with the application areas and must be present to monitor herbicide application in these areas. • Contractors applying herbicides must follow all applicable regulations regarding herbicide use. **Protocol 3a- Field Preparation Procedures:** • Contractors shall follow all specifications/recommendations provided by the manufacturer for mixing and application of herbicides. Only the minimum amount of chemicals required to adequately complete the job shall be mixed.	During construction	LADWP USFS BLM			

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	• Herbicide chemical mixing and vehicle loading must be conducted before entering the field, and all vehicles shall contain Hazardous Materials Spill Management Kits. • Calibrate and inspect all spray equipment before entering the field to maintain adequate functionality. • Distribute safety equipment, information, and emergency supplies to the application crew, including splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and Materials Safety Data Sheets (MSDS), for all materials to be used on the job. **Protocol 3b- In-Field Preliminary Procedures:** • Before each herbicide application, the local weather conditions and the physical and climatic setting of the target area must be evaluated. • Before herbicide application, mechanically remove appropriate vegetation at the target sites, as applicable. Minimize unnecessary environmental disturbance by preparing the work area at target sites. **Protocol 3c- Application Restrictions:** • Avoid contact with areas frequently occupied by humans and domestic animals and/or their food sources (i.e., yards, pens, food crops, drinking water, feed storage areas). • Protect wildlife and valued vegetation from direct contact with herbicides. Only chemicals that are non-toxic to birds and small mammals shall be applied in areas where nests or dens are observed. • Protect aquatic wildlife from chemical runoff. Avoid spraying within 50 feet of well heads. Avoid spraying near roadside drainage channels or within 50 feet of any surface water body when water present. • Avoid application under the following conditions to avoid chemical drift and contamination outside the target sites: Under conditions of rain or when rain is imminent, during site irrigation, when the target site contains puddles, when the site has a slope that exceeds a 1:1 ratio. • Avoid chemical drift outside of target sites by avoiding application during wind velocities in excess of 10 mph. If chemical drift is observed during application, discontinue spraying until conditions causing the drift stop. **Protocol 3d- In-Field Application Procedures:** • Complete preliminary site evaluation checks to record adverse conditions identified in the field. Avoid application in those areas. • Do not dump excess pesticide onto soil or into drains. Do not dump or scatter vegetation waste into drainage canals or surface water bodies. Avoid fueling of maintenance vehicles/equipment within 100 feet of water bodies. • Apply the minimum amount of chemicals necessary to complete the objective at the site. Minimize overlapping previously sprayed areas. **Protocol 4- Post-Application Protocols:** • Spray tanks shall be cleaned at the Project staging yards and shall be appropriately reused. Excess herbicide and containers shall be stored and disposed of according to the manufacturer's label by the construction contractor. After application, a record of herbicide application performed at each target site shall be provided by the contractor to LADWP, the USFS, and the BLM, as appropriate. **Protocol 5- Spill Clean-up Procedures:** • Immediately after a spill incident, absorbent material shall be applied. Affected media shall then be placed into a hazardous material storage container, and LADWP would be notified. • If wildlife nests or dens are accidentally sprayed, personnel shall immediately notify their supervisor, who shall report the incident to LADWP within 24 hours.					
Visual Resources						
VIS-1	**Crossing Linear Features** - To reduce visual impacts at crossings of linear features identified as highly sensitive in the visual resources inventory, towers shall be placed at the maximum feasible distance from the crossing within limits of standard tower design. On ANF lands, to the extent practical, LADWP shall design and space all new transmission line structures at road crossings and trail crossings so that conductors are approximately mid-span at the road or trail. Structures should be set as far back from the crossing as possible. When feasible, crossings should be made at right angles and the site chosen for the crossing should be the one that will result in the least disturbance or alteration of the natural landscape.	Prior to construction	LADWP USFS			
VIS-2	**Feathered Vegetation Clearing** - Where vegetative clearing is necessary, to the greatest extent possible, clearing edges shall be tapered and feathered to reduce the visual impact.	During construction	LADWP USFS BLM			

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VIS-3	**Existing Access Road Widening or Upgrades** - To the greatest extent possible, LADWP shall use existing and already maintained access roads and spur roads to perform project construction. Where erosion potential has been identified as severe or very severe in the visual contrast analysis, no widening or upgrading of existing access roads shall be undertaken in the area of construction and operation, except for repairs necessary to make roads passable and where the USFS has approved plans submitted by LADWP before construction.	Prior to and during construction	LADWP USFS BLM			
VIS-4	**Pacific Crest National Scenic Trail** - Where the proposed transmission line route crosses the Pacific Crest National Scenic Trail, the transmission towers shall be engineered to be placed as far away from the Foreground viewshed (0.5 mile) of the Trail as feasibly possible within engineering constraints, and a minimum of 300 feet from the PCT if possible.	During construction	LADWP USFS			
VIS-5	**Clean Up Construction Related Areas** - LADWP shall keep construction-related operations areas clean and tidy by storing building materials and equipment within the proposed construction staging areas and/or generally away from public view when feasible. LADWP shall remove construction debris, including temporary fencing when no longer needed, promptly and at regular intervals. For ANF lands, in areas where cleared vegetation would be visible from sensitive viewing locations, LADWP shall dispose of cleared vegetation and woody material off-site (not necessarily off-ANF land), or chip and store for restoration work, as approved by the USFS, in a manner that is not visually evident and does not create visual contrasts.	During construction	LADWP USFS BLM			
VIS-6	**Construction Site Clean Up and Restoration** - When the construction period is over, construction sites shall be cleaned up and their surfaces shall be restored as closely as possible to pre-construction conditions.	Post construction	LADWP USFS BLM			
VIS-7	**Fence Screening** - All temporary chain-link fencing installed during the construction process shall be covered with screening fabric or slats and shall be maintained in good working condition until the fence is removed. This process will help provide screening from construction activities, equipment and materials. The fabric/slat colors shall be selected based on what best blends in to the immediate surroundings of where they are being used.	During construction	LADWP USFS BLM			
VIS-8	**Reduce Glare and Light Spill** - Where applicable, the lighting specified during the implementation of this Project shall be the minimum required to meet safety and security standards. All light fixtures shall be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the fixtures shall have sensors or switches to permit the lighting to be turned off at times when not required.	During construction	LADWP USFS BLM			
VIS-9	**Darkened Structure Treatment** – LADWP shall implement darkened steel lattice structure treatment for selected locations within the ANF for the new 230kV transmission line. For each Alternative, treatment options and selected locations for the new 230 kV transmission line are as follows: • Alternative 1: dark grey, mileposts 58.2 – 73.8 • Alternative 2: dark grey, mileposts 51.7 - 52.6, 54.9 – 58.5 • Alternative 2a: in addition all the Alternative 2 treatment options and locations: medium grey, mileposts 0.0 - 6.6 • Alternative 3: none	During construction	LADWP USFS			
VIS-10	**Landscape Screening** - To the extent practical, LADWP shall locate new transmission line structures in areas where they are screened by natural landscape features (e.g., behind a hill) so that they are seldom seen by ANF visitors or the general public. Natural topography lines should be followed to soften the visual impact of structures and of disturbances of soils and vegetation. Avoid placing lines in the center of valleys or draws where they would be even more prominent. To the extent feasible, the final locations of transmission structures shall be adjusted to avoid locations that place the structures in the middle of the line of sight from roads, trails and other important views. New routes should follow vegetative edges whenever possible for added screening and to soften the visual impact of the transmission line.	Prior to construction	LADWP USFS			
VIS-11	**Avoid Skylining of Towers** - To the extent practical, LADWP shall design and locate new transmission lines so that they do not break the skyline or are directly on the skyline when viewed from sensitive viewpoints. LADWP shall consult with the USFS to ensure that the objectives of this measure are achieved.	Prior to construction	LADWP USFS			
VIS-12	**Minimize Vegetation Clearing** - To the extent practical, LADWP shall keep modifications of the natural settings to what is minimally required for safe, efficient construction, operation, and maintenance of the Project. Areas that are cleared/opened solely for safe access during the construction stage and that exceed the need for permanent future access into the site shall be restored to the greatest extent possible.	During construction	LADWP USFS BLM			
VIS-13	**Avoid Locating New Roads in Bedrock** - Where feasible, re-opened and/or new access road and spur road locations on ANF land shall be designed to avoid bedrock cuts, and all road cuts shall be in soil material to protect landscape character, ensure revegetation opportunities, and promote visual quality.	During construction	LADWP USFS			
VIS-14	**Excavated Materials Disposal** - For ANF lands, LADWP shall dispose of excavated materials (excess soil and rocks, etc.) in disposal areas (either on ANF lands or off ANF lands) as designated by the USFS. Where applicable, any tower footings designated for removal (concrete, reinforcing steel, angle steel, anchor bolts, etc.) shall be disposed off ANF lands.	During construction	LADWP USFS			
VIS-15	**Construction Area Site Selection** - To the extent feasible, the sites selected for use as construction yards, pull sites, helicopter landing zones, laydown areas, etc., shall be areas that are already flat, disturbed, and/or clear of vegetation, which would require the least amount of modification, clearing, and soil disturbance. To the extent feasible, these construction features shall be in areas of low visual sensitivity.	During construction	LADWP USFS BLM			

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				Initials	Date	Remarks
VIS-16	**Compensation for Impacts to Landscape Character and Visual Quality** – All reasonable efforts shall be made to meet the Scenic Integrity Objectives (SIOs) shown on the SIO Map in the ANF Land Management Plan. Minor adjustments that exceed a drop of more than one SIO level are allowable, with the Forest Supervisor's approval, for necessary projects that meet a greater public need and cannot be reasonably accommodated on non-NFS land. In areas where the SIOs cannot be met, LADWP and the Forest Supervisor shall reach a consensus on what is a commensurate amount of Visual/Scenery Management related restoration or compensation to the ANF to make up for the Project's long-term visual impacts to the landscape character and visual quality, including but not limited to impacts to landscape character and visual quality of scenic highway and scenic trail viewsheds.	During construction	LADWP USFS			
VIS-17	**Span Matching of Existing Structures** – To the extent practicable and within the limits of standard structure design, LADWP shall match existing structure spacing, spans and heights as closely as possible to reduce visual complexity as seen from high concern viewpoints.	Prior to construction	LADWP USFS BLM			
VIS-18	**Treat New Concrete Footings and any other permanent Project-related structures with Visually Appropriate Color or Construction Materials in Selected Areas** – Within the limits of normal construction practice and in areas on the ANF identified during final design by the ANF landscape architect and approved by the Authorized Officer, LADWP shall apply a one-time treatment or application on the exposed surfaces of all new footings and concrete structures using the vendor's standard method (a concrete additive or stain, to be determined during final design). Up to three colors may be chosen by the ANF landscape architect; however, consideration would be given to apply the colors in a reasonable approach to limit the non-contiguous use of each color. Other constructed permanent (3 years or more) features/structures including, but not limited to, retaining walls, fences, gates, drains, culverts, bridges, low water crossings, etc., on the ANF must meet the guidelines in the Built Environment Image Guide and the SMS to the extent feasible and be approved by the ANF landscape architect and the authorized officer.	During construction	LADWP USFS			
Cultural Resources						
CUL-1	To avoid or reduce impacts to cultural resources on federal, State, city and private land, the ANF, BLM, California SHPO, and LADWP will develop and implement a Programmatic Agreement (PA) to comply with Section 106 of the NHPA, in accordance with the implementing regulations at 36 CFR 800.14(b). As stipulated in 36 CFR 800.14(b), the PA will document the alternate procedures and guidelines to resolve potential adverse effects or impacts that may result from the construction, operation, and maintenance of the BRRTP. The development of the PA will involve the appropriate government-to-government consultations pursuant to 36 CFR 800.16(f)(1) and invite participation by interested groups, organizations, and individuals, per 36 CFR 800.16(e)(2). The PA will require a Construction Phase Management Plan (CPMP) and a Historic Properties/Historical Resources Management Plan (HP/HRMP). Provisions of the CPMP will be implemented before and during construction; provisions of the HP/HRMP will be implemented following construction during operation and maintenance of the BRRTP. The PA will be signed by the signatories and invited signatories before issuance of the Record of Decision (ROD) by the ANF and BLM.	Prior to and during construction, and operation and maintenance.	LADWP USFS BLM			
Wildfire and Fuels						
F-1a	**Eliminate Transmission Line Bounded Islands.** LADWP shall eliminate the transmission line bounded islands, as feasible within the limits of standard transmission line design, that would be created by the proposed transmission line along Alternative 1, Alternative 2, and Alternative 2a where the new line departs and remerges with the existing transmission line corridors. Specifically, this would apply to Alternative 1 between mile markers 52.2 and 52.7 and 55.2 and 55.7; Alternative 2 between mile markers 55.0 and 55.7; and Alternative 2a between mile markers 55.0 and 55.6.	Prior to construction	LADWP USFS BLM			
F-1b	**Remove the Potential for Wooden Pole Contact.** Within the limits of standard transmission line design, the Project should be constructed to avoid potential conflict of existing wooden poles from either conductor contact or from the placement of the new transmission structures. If avoidance of the wooden poles is not possible through design of the Project, then LADWP would coordinate with the responsible utility to rebuild as steel poles or relocate the wooden poles to meet standard avoidance practice. Potential wooden pole contact exists along Alternative 1 between mile markers 52.2 and 53.4, Alternative 2 between mile markers 52.7 and 54.7, Alternative 2a between mile markers 52.7 and 54.7, Alternative 3 between mile markers 41.0 and 53.9, and along the reconductoring of the existing BR-RIN 230 kV transmission line in the same mile marker locations of the new line listed above under Alternative 2.	During construction	LADWP USFS BLM			
F-1c	**Share Costs for ANF Fuel Break Maintenance Programs.** LADWP shall enter into a cost-sharing agreement with the USFS for maintenance of existing backbone fuelbreaks within the ANF that are close (within 0.25 mile of the proposed centerline) to the Project or that transect one of the Alternatives. A backbone fuelbreak is an identified key ridge or other linear geographical feature that has a high level of effectiveness in slowing or containing a wildfire. LADWP's responsibility under the cost-sharing agreement would be established through coordination between LADWP and USFS. Responsibility would be proportional to the Project's potential impacts on wildfire prevention and suppression. The fuelbreaks program between USFS and LADWP shall be finalized before transmission line energization.	Prior to and during construction	LADWP USFS			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency*	Verification of Compliance		
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F-1d	**Provide Transmission Line Safety Training to Regional Fire Prevention Agency Staff.** LADWP and fire prevention agencies shall coordinate to provide transmission line bi-lateral/cooperative fire safety training to regional fire prevention agency staff before the start of the official fire season following construction of the Project. LADWP and the agencies will coordinate and mutually decide if additional training is needed in subsequent years, and on the duration, content and most productive methods to conduct the bi-lateral training. A key element of this bi-lateral/cooperative training mitigation is to allow for the exchange of BRRTP-specific construction, maintenance and operation activities planned for the coming year, as well as to update both Utility and Fire Agency emergency fire reporting and fire suppression coordination procedures.	Operation and maintenance	LADWP USFS			
F-1e	**Coordinate During Emergency Fire Suppression Activities.** In the event of a fire within the Project area, LADWP would coordinate construction activities with fire agencies to avoid obstructions to firefighting activities. The following provisions shall be defined based on consultation with fire agencies. Onsite LADWP and contracted personnel shall coordinate fire suppression activities through the active Fire Incident Commander, and emergency ingress and egress to construction-related access roads shall remain unobstructed at all times during active firefighting activities. Construction in the work area shall cease in the event of a fire within 1,000 feet of the work area or a distance deemed to be unsafe for construction crews. The work area includes the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. LADWP shall contact cooperating fire agency dispatches seven days before helicopter use and shall provide dispatch centers with radio frequencies being used by the aircraft, aircraft identifiers, the number of helicopters that would be used while working on or near CAL FIRE Contract County and ANF lands at any given time, and the flight pattern of helicopters to be used. Should a wildfire occur within five (5) miles of the work area, if instructed by the Incident Commander and/or Forest Aviation Officer, construction-related helicopters in use by LADWP shall immediately cease construction activities and not restart aerial operations until authorized by the appropriate fire agency.	During construction	LADWP USFS BLM			
F-1f	**Implement FAA/USFS Review for the Appropriate Installation of Aerial Warning Signage and/or Lighting per FAA "Advisory AC70-7460 – Obstruction Marking and Lighting."** Before approval of final Project design, LADWP shall consult with the FAA in regards to Aerial Warning Signage and/or lighting per FAA "Advisory AC70-7460 – Obstructions Marking and Lighting" dated Feb. 1, 2007. Following FAA coordination, LADWP would contact Aerial Fire Suppression agencies for updates related to the location and final design of the transmission line, including tower heights and any warning signage and/or lighting required by the FAA.	Prior to construction	LADWP USFS			
F-2a	**Develop and Implement a Construction and Maintenance Fire Prevention Plan.** LADWP shall coordinate, develop and implement a Fire Prevention and Vegetation Management Plan, which may be incorporated into the overall COM Plan, to cover construction and maintenance activities associated with the Project. The Plan would include monitoring activities during construction to ensure implementation and effectiveness of the Plan. The Plan would be applicable to the entirety of the Proposed Action or Alternative during all construction and maintenance activities. The Plan will be developed in coordination with USFS and BLM, with input from the CAL FIRE Contract County. The plan will be approved by the Forest Service and BLM prior the start of any construction activities. At a minimum, Plan contents shall include the requirements of ANF Fire Management Plan and Title 14 of the California Code of Regulations, Article 8 #918 "Fire Protection." Based on these requirements, the plan will include procedures for reporting fires, minimum fire suppression equipment requirements, communication, construction restrictions based on fire conditions, fire patrols, and fire suppression water supplies.	Prior to construction	LADWP USFS BLM			
F-2b	**Cease Work During Red Flag Conditions.** During Red Flag Warning events, as issued daily by the National Weather Service and the Los Angeles County Fire Department in Federal Responsibility Areas (FRAs) and Local Responsibility Areas (LRAs), all non-emergency construction and maintenance activities shall cease in affected areas. An exception shall be made for transmission line testing where a transmission line may be tested if the loss of another transmission facility could lead to system instability or cascading outages.	During construction and operation & maintenance	LADWP USFS BLM			
F-2c	**Remove Hazards from the Work Areas.** Before starting construction and/or maintenance work on the Project, LADWP shall clear or remove brush and dead and decaying vegetation that would pose a fire hazard from the work area. The work area includes the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, remote helicopter construction sites, helicopter fueling/maintenance sites and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. For ground-based construction, cleared vegetation may either be removed or chipped and spread onsite in piles no higher than six (6) inches.	Prior to construction	LADWP USFS BLM			

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				Initials	Date	Remarks
F-3a	**Fire Prevention On Private Property.** The BRRTP fireshed assessment area comprises 55% non-federal ownership that includes many homes, businesses, and other structures associated with these communities. Active fire prevention practices by home- and land-owners would mitigate and decrease the potential for loss of private property, including homes, in the event of a wildfire. Fire prevention practices primarily include creation of defensible space around structures (compliance with Public Resources Code 4291) but can also include retrofitting rooftops with fire-proof materials, fire shutters, double pan windows, eave boxing, removal of attic vents, automatic or remotely operated water sprinklers and automatic or remotely operated, generator-supported water systems, and removal or replacement of wood fencing and decks with fire-resistant materials. There are various existing programs at the federal, state, and local level that are available to individual land owners and communities for education and funding for specific wildfire prevention measures. These programs and grants are available through the National Fire Protection Association's (NFPA) Firewise Communities, the National Fire Plan, FEMA Region IX, the California Fire Safe Council, and locally with the Angeles Forest Valleys and Lakes Fire Safe Council, as well as numerous private foundations. The responsibility to implement and maintain these fire prevention measures as part of this mitigation measure on private property lies with the individual land/home owner. State and Local fire agencies have enforcement authority for state and local code requirements.	Prior to and during construction, and operation & maintenance	None (individual land/home owner)			
Biological Resources						
BIO-1	*Provide restoration/compensation for impacted sensitive vegetation communities.* **1a** The intent of this mitigation measure is to require LADWP to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF) Land Management Plan (LMP). Before construction LADWP shall have a qualified biologist, where concurrence on the biologist has been provided by the USFS and approval on the biologist has been provided by the BLM, document the community type and acreage of vegetation that would be subject to Project disturbance. Impacts to all oaks and native trees will be documented by identifying the species, number, location, and diameter at breast height (DBH). On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. 1) For NFS and BLM lands, the USFS and BLM shall review and approve a Habitat Restoration and Revegetation Plan, prepared by LADWP in coordination with the federal agencies, for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-federal lands, LADWP shall prepare the Habitat Restoration and Revegetation Plan. Both plans shall include at minimum: (a) the location of the mitigation site (off-site mitigation may be required); (b) locations and details for topsoil storage; (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bare-root or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program;(j) locations and impacts to all oaks and native trees (over 3 inches DBH); (k) locations of temporary or permanent gates, barricades, law enforcement patrolling, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the USFS and BLM (NFS and BLM lands only). Restoration efforts will not adversely affect listed species or critical habitat and measures will be implemented to protect these species during restoration. 2) LADWP shall utilize a USFS/BLM approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All areas dominated by non-native species before Project disturbance shall be revegetated using appropriate native species. The seed mix shall consist of native, locally occurring species collected from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc. will be accepted without the approval of the USFS and BLM on NFS/BLM lands, and seeds must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-Project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring reporting will be yearly from years one to five and every other year from years six to ten or until the success criteria are met. LADWP shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the ANF LMP. If the survival and cover requirements have not been met, LADWP is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned. 3) On NFS land, the USFS/LADWP will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees (over 3 inches DBH) in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location, and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes, shall not occur until the trees are evaluated by a USFS botanist or authorized arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or adding spoil	Prior to and during construction, post construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency*	Verification of Compliance		
				Initials	Date	Remarks
	around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be replaced at the rate appropriate to the DBH. 4) The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks that are to be removed on the ANF shall be as follows: trees from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured following California Department of Fish and Game (CDFG) guidelines. On the ANF, any oak or native tree that must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated (off-site) at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by an authorized arborist and USFS botanist. On non-federal lands, all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. 5) Permanent impacts on federal lands shall be determined by the appropriate federal manager (USFS and BLM) at the ratios stated below (Table BIO-MM-1) or at a comparable value. On NFS and BLM lands, impacts will be considered permanent if the trees are not likely to recover by ten years post-disturbance. Where on-site restoration is planned for mitigation of temporary impacts to vegetation communities, LADWP shall identify a Habitat Restoration Specialist, where concurrence has been provided by the USFS, to implement the method of restoration outlined by the USFS/BLM in the Habitat Restoration Plan. 6) On USFS/BLM lands, the creation or restoration of habitat shall be monitored after mitigation site construction to assess progress and identify potential problems with the restoration site. This will be monitored on USFS/BLM lands until the success criteria outlined in the restoration plan are met annually for years one to five, and bi-annually for years six to ten. Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken until the success criteria are met as specified above, to ensure the success of the restoration effort. If the mitigation fails to meet the established success criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the USFS/BLM (as appropriate). If a fire occurs in a revegetation area before the success criteria are met, LADWP shall be responsible for a one-time replacement of vegetation. If a second fire occurs, no replanting is required, unless the fire is caused by LADWP activity. Off-site mitigation for NFS/BLM and non-NFS/BLM lands may be required if mitigation rates exceed what can be achieved on NFS/BLM land. This may be in the form of funding for land acquisition for inclusion into the Angeles National Forest or BLM lands affected by the Project, mitigation banking, removing existing structures, or comparable restoration efforts. **1b** During and after construction, USFS/BLM-identified potential or existing entrances to Project-related disturbed areas such as access/spur roads, pull sites, staging areas, fly yards, landing zones, etc. on NFS/BLM lands shall be gated, blockaded and/or concealed in some manner and maintained to prevent the unauthorized use by the general public. Signs prohibiting unauthorized use of these disturbance areas shall be posted on these barricades if deemed necessary by the USFS/BLM. If barricades are being compromised, law enforcement patrolling may also be implemented to control unauthorized access onto Project disturbance areas. **1c** **Treat cut tree stumps with Sporax.** All stumps of trees (conifers and hardwoods) resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the USFS.					

TABLE BIO-MM-1. SUMMARY OF ESTIMATED IMPACTS TO VEGETATION COMMUNITIES ON FEDERAL LANDS

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Alternative 1								
Chamise Chaparral	USFS	16.73	3:1	50.19	56.06	1:1	56.06	106.25
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.30
Riversidian Sage Scrub	USFS	3.06	5:1	15.3	10.48	2:1	20.96	36.26
Southern Coast Live Oak Riparian	USFS	0.05	5:1	0.25	0.38	2:1	0.76	1.01

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
Forest								
Southern Cottonwood Willow Riparian Forest	USFS	0.42	5:1	2.1	0.86	2:1	1.72	3.82
Southern Mixed Chaparral	USFS	14.13	3:1	42.39	45.81	1:1	45.81	88.20
Southern Sycamore Alder Riparian Woodland	USFS	0.13	5:1	0.65	0.25	2:1	0.5	1.15
Southern Willow Scrub	USFS	0.32	3:1	0.96	1.30	2:1	2.6	3.56
Alternative 2								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	7.8	1:1	7.8	24.8	1:1	24.8	32.6
Mojave Creosote Bush Scrub	BLM	2.69	1:1	2.69	21.82	1:1	21.82	24.51
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.06	1:1	2.06	2.31
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.39	2:1	6.78	10.23
Southern Mixed Chaparral	USFS	3.24	3:1	9.72	8.77	1:1	8.77	18.49
Southern Riparian Scrub	USFS	0.33	3:1	0.99	0.66	1:1	0.66	1.65
Southern Sycamore Alder Riparian Woodland	USFS	0.87	5:1	4.35	2.2	2:1	4.4	8.75
Alternative 2a								
Chamise Chaparral	USFS	10.11	3:1	30.33	39.38	1:1	39.38	69.71
Barren/developed	USFS	3.24	1:1	3.24	12.72	1:1	12.72	15.96
Interior Live Oak Chaparral	USFS	2.06	5:1	10.3	5.60	2:1	11.2	21.5
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	1.84	5:1	9.2	8.85	2:1	17.7	26.9
Scrub Oak Chaparral	USFS	1.46	5:1	7.3	3.19	2:1	6.38	13.68
Southern Coast Live Oak Riparian Forest	USFS	0.69	5:1	3.45	3.40	2:1	6.8	10.25
Southern Mixed Chaparral	USFS	9.03	3:1	27.09	27.88	1:1	27.88	54.97
Southern Riparian Scrub	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland	USFS	0.81	5:1	4.05	1.64	2:1	3.28	7.33
Alternative 3								
Chamise Chaparral	BLM	0.00	1:1	0.0	0.02	1:1	0.02	0.02
Barren/developed	USFS	1.04	1:1	1.04	2.13	1:1	2.13	3.17
Mojave Creosote Bush Scrub	BLM	2.68	1:1	2.68	21.81	1:1	21.81	24.49
Mojave Wash Scrub	BLM	0.25	1:1	0.25	2.05	1:1	2.05	2.3
Riversidian Sage Scrub	USFS	9.57	5:1	47.85	28.19	2:1	56.38	104.23
Scrub Oak Chaparral	USFS	2.87	5:1	14.35	5.83	2:1	11.66	26.01
Southern Riparian Scrub	USFS	0.34	5:1	1.7	0.69	2:1	1.38	3.08
New Circuit								
Chamise Chaparral	USFS	8.03	3:1	24.09	23.05	1:1	23.05	47.14
Riversidian Sage Scrub	BLM	0.04	1:1	0.04	0.34	1:1	0.34	0.38
Riversidian Sage Scrub	USFS	1.98	5:1	9.9	5.96	2:1	11.92	21.82
Southern Coast Live Oak Riparian Forest	USFS	0.08	5:1	0.4	0.66	2:1	1.32	1.72
Southern Cottonwood Willow Riparian Forest	USFS	0.40	5:1	2.0	0.80	2:1	1.6	3.6
Southern Sycamore Alder Riparian Woodland	USFS	0.09	5:1	0.45	0.19	2:1	0.38	0.83
Reconductoring								
Chamise Chaparral (Segment ABG)	USFS	16.07	3:1	48.21	32.65	1:1	32.65	80.86
Barren/developed (Segment ABG)	USFS	7.77	1:1	7.77	25.28	1:1	25.28	33.05
Mojave Creosote Bush Scrub	BLM	2.85	1:1	2.85	23.16	1:1	23.16	26.01

Vegetation Communities	Jurisdiction	Permanent Impacts (acres)			Temporary Impact (acres)			Total Estimated Mitigation (acres)
		Estimated Impact	Ratio	Estimated Off-site Mitigation	Estimated Impact	Ratio	Estimated On-site Restoration	
(Segment ABG)								
Mojave Wash Scrub (Segment ABG)	BLM	0.23	1:1	0.23	1.86	1:1	1.86	2.09
Riversidian Sage Scrub (Segment ABG)	USFS	5.07	5:1	25.35	10.30	2:1	20.6	45.95
Southern Coast Live Oak Riparian Forest (Segment ABG)	USFS	3.25	5:1	16.25	6.60	2:1	13.2	29.45
Southern Mixed Chaparral (Segment ABG)	USFS	2.86	3:1	8.58	8.01	1:1	8.01	16.59
Southern Riparian Scrub (Segment ABG)	USFS	0.33	5:1	1.65	0.66	2:1	1.32	2.97
Southern Sycamore Alder Riparian Woodland (Segment ABG)	USFS	0.95	5:1	4.75	2.34	2:1	4.68	9.43
Southern Coast Live Oak Riparian Forest (Segment K)	BLM	0.02	1:1	0.02	0.04	1:1	0.04	0.06
Southern Mixed Chaparral (Segment K)	BLM	0.00	1:1	0.0	0.01	1:1	0.01	0.01

Note: The permanent and temporary impact calculations provided above are estimates based on the impact model described in Appendix C of the Biological Resources Technical Report. Therefore, acreage numbers for the habitat types listed above may be smaller than those listed in the table. Preconstruction surveys will be conducted to estimate the acreage impacts and will be based on the final design not the impact model.

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
BIO-2	*The following prescriptions would prevent the spread of invasive weeds into previously uninfested areas in the designated construction right-of-way.* **2a Prepare and implement a Weed Control Plan.** LADWP/ANF/BLM shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS/BLM lands for pre-construction and construction invasive weed abatement. The Weed Control Plan, including monitoring and eradication, will be part of the 50 year Operations and Maintenance Permit. On ROW easement lands administered by the USFS/BLM, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations including consulting with CDFG on CESA species. The Weed Control Plan shall be submitted to the USFS/BLM for final authorization of weed control methods, practices, and timing before implementation of the Weed Control Plan on public lands. Weed control on BLM lands using pesticides would require site-specific NEPA analysis and an approved BLM Pesticide Use Permit. Pesticide Use Permits are issued for a maximum of three years. ROW easements on private lands shall include provisions such as wheel and equipment washing as part of implementation of the Weed Control Plan. The Weed Control Plan shall include the following stipulations: 1) A pre-construction weed inventory shall be conducted on NFS and BLM lands by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006); (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the USFS and/or BLM as species of priority (for NFS/BLM lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated before construction according to control methods and practices for invasive weed populations designed in consultation with the USFS/BLM. The Weed Control Plan shall be updated and guide post-construction eradication and monitoring efforts. 2) Weed control treatments shall include all legally permitted herbicide application, manual, and mechanical methods applied with the authorization of the USFS/BLM. The application of herbicides shall be in compliance with all State and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the USFS/BLM, and implemented by a Licensed Qualified Applicator. The most effective herbicides with the least toxic surfactant available shal be used. Herbicides shall not be applied during or within 24 hours of a 70% chance of occurring rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the USFS. In riparian areas, only water-safe herbicides, surfactants and adjuvants shall be used. Herbicides shall not be applied by spray equipment when wind velocities exceed 6 mph. Herbicides applied by sponge or paintbrush to cut stumps shall not be applied at wind speeds over 15 mph. In	Prior to and during construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
	areas containing special-status plants or animals, there will be a 5- to 70-foot buffer where herbicides are not used. The size of the buffer will be determined and flagged for avoidance by an approved botanist/biologist, based on phenology or life cycle at time of treatment, rareness and imperilment of adjacent native species, herbicide being used, method of herbicide application, concentration of herbicide being used based on no observed effect to non-target species, and/or environmental conditions and terrain. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the USFS/BLM. The timing of the weed control treatment shall be determined for each plant species in consultation with the USFS/BLM (on NFS/BLM lands) with the goal of controlling populations before they start producing seeds. Pre-emergent herbicides will only be used in areas that have a very low potential for supporting native plant species after disturbance, as determined by an authorized botanist. For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows. 3) On the ANF and BLM lands, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten, or until success criteria as outlined in the Weed Control Plan are met. Treatment of all identified weed populations shall occur at an appropriate interval so as to meet the success criteria. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that site. 4) During Project preconstruction and construction, all seeds and straw materials shall be weed-free when available, and all gravel and fill material shall be certified weed-free by the county Agriculture Commissioners' Offices. Any deviation from this must be approved by a USFS/BLM botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the USFS/BLM. 5) Before beginning preconstruction activities, the USFS and the BLM, in coordination with LADWP, will determine suitable locations to install field washing stations as part of the Weed Control Plan. Before commencing construction activities, LADWP shall document that all vehicles, equipment, and tools used on the Project have been cleaned at existing construction yard wash facilities or legally operating car washes. This is a one-time requirement designed to address the potential of new species of weeds being transported from outside the area. If, however, vehicles, equipment, or tools are used or driven off paved roads on non-NFS/BLM lands, washing must occur before entering USFS/BLM lands. During Project preconstruction and construction, all vehicles, equipment, or tools which will be used outside of permitted Project roadways shall be washed at the nearest wash station before operating off-road. In other areas also designated by the USFS/BLM, vehicles, equipment, and tools will be washed at the nearest wash station after exiting those areas. Vehicles that do not leave permitted Project roadways are not required to be washed after the initial washing described above. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the USFS/BLM. For NFS lands, plant material may also be removed by air compressors at USFS botanist/LADWP-approved locations. Written daily logs shall be kept for all vehicle/equipment/tool washing that records the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the USFS and BLM for inspection at any time and shall be submitted to the USFS and BLM permit administrators on a monthly basis. 6) During Project operation and maintenance activities, weeds shall be removed in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a USFS/BLM-approved method. **2b** **Remove weed seed sources from construction access routes.** Before construction, LADWP shall initiate invasive species eradication along construction access routes to minimize the potential of weeds spreading aggressively during construction. Post-construction, these treatment areas will be included and treated according to the restoration plan. Per the Forest Service Manual (FSM) 2080 Best Management Practice (BMP) guideline, LADWP shall also remove or reduce sources of weed seed along the travel routes associated with Project construction. Weed species identified along the Alternatives and associated access roads include tocalote, artichoke thistle, tree tobacco, saltcedar, slender wild oat/wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, blessed thistle, filaree, shortpod mustard, prickly lettuce, common horehound, yellow sweetclover, rabbit foot grass, Mediterranean grass, sowthistle, rat-tail fescue, tree-of-heaven, giant reed grass, yellow starthistle, bull thistle, fennel, perennial pepperweed, and black locust. To prevent the introduction or control the spread of invasive weeds, herbicide, hand removal or other control methods will be implemented to reduce seed production during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, LADWP shall identify, using an authorized plant ecologist, any other weed seed sources that could contribute					

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Initials	Date	Remarks
	to Project-related weed spread on the ANF and BLM lands. Target infestations identified by Project surveys should be controlled before construction. LADWP shall initiate eradication of the target infestations discovered during pre-construction surveys along construction routes. **2c Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Before construction and during each year of construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF and BLM lands, weed-infested areas shall be hand-weeded and/or treated as appropriate for the individual weed species under the guidance of an authorized plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the USFS/BLM. Unless otherwise authorized by the USFS/BLM, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, bromes and other invasive weed seed production, by herbicide application or other control techniques prior to flowering. All plant debris shall be disposed of at a USFS/BLM approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by an authorized plant ecologist or restoration ecologist in coordination with LADWP and USFS/BLM botanist or weed specialist. **2d Use of Herbicides to Control Exotic Weeds.** LADWP may use herbicides where deemed necessary for the control of invasive weeds within the Project area. Weed control shall be species-specific, and herbicides shall be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for the particular weed species. To minimize potential impacts, weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the USFS/BLM. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a different follow-up treatment method after the initial removal occurs. Any herbicide use on NFS lands would be subject to the review and approval of the appropriate USFS personnel and in coordination with LADWP. On BLM lands, herbicide use will be guided by an approved, site-specific Pesticide Use Proposal.					
BIO-3	*Incorporate riparian area avoidance and permit measures.* The following actions and all permit conditions detailed within the U.S. Army Corps of Engineers individual or Nationwide 12 permit, CDFG 1602 Streambed Alteration Agreement, and RWQCB 401 water quality certification (subject to separate approval) would be implemented by the construction manager and environmental compliance monitor(s). **3a** LADWP shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in RCAs without the authorization of the USFS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1 to August 15) unless otherwise approved by the USFS. LADWP shall prepare and implement a USFS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project, including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include seasonal restrictions for vehicle or equipment passage, restrictions on what activities may occur (such as grading, vegetation removal or tree trimming), monitoring requirements, and restoration requirements. This Plan shall be submitted to the USFS for approval before construction or the grading of any access road. **3b** Before construction, an authorized biologist shall stake and flag or fence exclusion zones around all identified riparian areas. Such exclusion zones will include an appropriate buffer to preclude sediment intrusion into the riparian areas. Earth-moving activities shall be restricted from these zones, although essential vehicle operation and foot travel will be permitted on existing roads, bridges, and crossings. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities will be prohibited within the exclusion zone. **3c** In areas where riparian habitats are unavoidable, the construction manager, in consultation with the lead environmental compliance inspector and USFS, shall narrow the width of the road through the area to the minimum extent required for safe travel. New spur roads and existing access road improvements shall be constructed and implemented using methodology that preserves existing hydrology. **3d** Towers shall not be constructed in riparian areas. **3e** All temporarily disturbed riparian areas that would not be utilized for future routine operation and maintenance activities shall be restored according to the guidelines of the Habitat Restoration Plan to the extent required to ensure no net loss of habitat functions and values. Following construction activities, the areas will be restored as soon as practicable. **3f** Permanent, unavoidable losses of riparian areas will be mitigated by restoration and/or preservation of off-site habitats, as outlined in the Habitat Restoration Plan. The final mitigation and off-site restoration locations will be determined in consultation with LADWP and the relevant permitting agency(s). Mitigation acreage ratios will be consistent with those listed in Table BIO-MM-1.	Prior to and during construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency	Verification of Compliance		
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BIO-4	*Provide restoration/compensation for affected jurisdictional areas.* **4a** Impacts to areas under jurisdiction of the USACE, RWQCB, USFS and CDFG shall be avoided to the extent feasible. Where avoidance of jurisdictional areas is not feasible, including emergency repairs, and access/spur roads within RCAs, the applicant shall provide the necessary mitigation required as part of wetland permitting. This will include creation, restoration, and/or preservation of suitable jurisdictional habitat along with adequate buffers to protect the function and values of jurisdictional area mitigation. The location(s) of the mitigation will be determined in consultation with LADWP and the responsible agency(s) as part of the wetland permitting process. **4b** Measures 3a, b, c, and d will also be incorporated to avoid and protect jurisdictional areas.	During construction	LADWP USFS BLM			
BIO-5	*Construction activities and vehicle operation would be conducted to minimize potential disturbance to wildlife.* **5a.** Conduct preconstruction surveys in locations where potential habitat exists for special-status species to avoid impacts during construction. If wildlife sign or habitat is detected during the surveys, construction activities will be monitored by authorized biologists, or exclusion fencing will be placed around work areas. If federally listed species are found within the area of potential effect, the authorized biologist shall notify the construction manager and the USFWS. The construction manager, in consultation with the USFWS and the authorized biologist, will have the authority to halt all activities until appropriate avoidance measures have been completed. If non-federal special-status species are found within the area of potential effect, the USFS, BLM, and CDFG will be notified and, in consultation with these agencies, agreed-upon appropriate actions to address impacts to the species will be implemented. This only applies to species that are not listed under the California Endangered Species Act (CESA) unless authorized by an Incidental Take Permit (ITP) or not fully protected under Fish and Game Code or Title 14, California Code of Regulations (CCR). **5b.** Cover all steep-walled trenches or excavations used during construction to prevent entrapment of wildlife (e.g., reptiles and small mammals). If the trenches or excavations cannot be covered, escape ramps shall be placed into the trench or excavated area, or exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife, shall be inspected by the authorized biologists a minimum of three times per day and immediately before backfilling. All excavated areas shall be covered if left overnight. Furthermore, employees and contractors shall look under vehicles and equipment for the presence of wildlife before moving the vehicle or equipment. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is moved out of harm's way by an authorized biologist. Should a dead or injured special-status species be found in a trench or excavation or anywhere in the construction zone or along an access road, the authorized biologist shall contact BLM and/or USFS (for activities on land managed by the agencies) and the Wildlife Agencies within 48 hours of the finding. The authorized biologist shall record the species found, the location of the finding, and the cause of death (if known), and shall submit a photograph and any other pertinent information; this information shall be submitted to the appropriate wildlife agency.	Prior to and during construction	LADWP USFS BLM			
BIO-6	*Implement a Worker Environmental Awareness Program.* An authorized biologist(s) shall conduct a detailed biological Worker Environmental Awareness Program (WEAP) for all Project personnel before any construction or activities within the Project footprint. The WEAP shall include discussions of Project permits and brief summaries of their conditions; discussions of agency involvement, their applicable sensitivity measures, and relevant environmental protection legislation (e.g., the Endangered Species Act, the Migratory Bird Treaty Act); descriptions of special-status species and other sensitive resources that could exist in the Project area, along with their locations, legal status and protections; and a review of all measures to be implemented for avoidance of these sensitive resources. The final list of wildlife species to be included in the WEAP may be reduced at the discretion of the biologist with concurrence from applicable agencies. **6a.** Training materials and briefings shall also include the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS and BLM lands and identification of USFS and BLM sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. Discussion of GPs and BMPs shall include topics such as appropriate work limits, avoiding the spread of non-native plant species, fire safety, wildlife avoidance, trash and debris collection, spill prevention and containment protocol, and appropriate protocol for passage and/or construction near riparian zones. Sightings of sensitive wildlife species or harmful encounters with any wildlife species shall be reported to the authorized biologist immediately for evaluation and, as necessary, reporting to agencies. **6b.** Training materials and a course outline shall be provided to the USFS/BLM for review and approval at least 30 days before the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (e.g., limited operating periods) will be provided to the environmental monitors and construction crews before ground disturbance. **6c.** The training shall be conducted for all crew members present for the start of construction. If new crew members are brought to the	Prior to and during construction	LADWP USFS BLM			

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	Project after this time, they shall take part in the WEAP before beginning construction work; if the authorized biologist is not available at this time, new crew members shall be given a summary handout of the WEAP until the full WEAP can be administered by the authorized biologist, to be conducted no more than one workweek following the crew members' assignment to the Project. All crew members who have completed the WEAP shall submit their names to a list to be updated continuously and furnished to agencies upon request. No construction worker may work in the field for more than five days without participating in the WEAP.					
BIO-7	*Impacts to Raptors.* **7a.** If Project construction activities cannot occur completely outside the bird breeding season, then pre-construction surveys for active nests shall be conducted by a qualified biologist within 1,200 feet of the construction zone no more than seven days before the initiation of construction that would occur between February 1 and August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG, BLM, and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the BLM and USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a species-specific buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The buffer (660-foot eagle and one-mile helicopter) may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance, with the approval of the U.S. Fish and Wildlife Service (USFWS), CDFG, BLM or USFS, as appropriate (USFS 2005). On NFS lands, the USFS shall apply the USFS Land Management Plan Standard S18 (Part 3 of the Land Management Plan), which states, "Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging." If for any reason a bird nest must be removed during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. On BLM lands, this will include coordination and written approval by the BLM. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent. **7b.** Before construction, LADWP shall identify all existing raptor nests that would be affected by Project construction. LADWP shall coordinate with the USFWS, CDFG, USFS and BLM for the proposed removal of nests that may present safety issues associated with the construction activities. All nest removals shall occur after the nest is demonstrated to be inactive by a qualified biologist and have been shown to not result in take as defined by the Migratory Bird Treaty Act (MBTA).	Prior to construction	LADWP USFS BLM			
BIO-8	*Avoid nesting season and limit disturbance of nesting birds.* LADWP shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, substation sites, access/spur road locations, or any other area subject to ground disturbance. Surveys for birds shall be conducted for all areas from February 1 to August 15. The required survey dates may be modified based on local conditions (e.g., high altitude locations) with the approval of the CDFG and/or USFS. LADWP shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The résumé of the proposed biologists will be provided to the USFS for concurrence before ground disturbance. If breeding birds with active nests are found, a biological monitor shall establish a 300-foot buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The 300-foot (or 660-foot eagle and one-mile helicopter) buffer may be adjusted to reflect existing conditions, including ambient noise, topography, and disturbance with the approval of the USFWS, CDFG, or USFS, as appropriate and in coordination with LADWP. On NFS lands, the USFS shall have the authority to define/redefine such buffers. The biological monitors shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The biological monitors shall be responsible for documenting the results of the surveys and the ongoing monitoring and will provide a copy of the monitoring reports for impact areas to the respective agencies (e.g., on NFS lands documentation will be provided to the Forest	Prior to and during construction	LADWP USFS BLM			

Number	Mitigation Measure	Time Frame for Implementation	Responsible Monitoring Agency	Verification of Compliance		
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	Biologist). If for any reason a bird nest must be removed during the nesting season, LADWP shall provide written documentation providing concurrence from the USFWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the USFS. LADWP shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent.					
BIO-11	*Reduce avian electrocutions/collisions on transmission lines.* Raptor safety protection will be required on tower/conductor (lines) in appropriate locations. The Project would have minimum clearance between phase conductors or between phase conductors and grounded hardware, as recommended by the Avian Power Line Interactive Committee (APLIC 2006), that are sufficient to protect even the largest birds, such as California condor, and therefore would present little to no risk of bird electrocution. New Project structures shall be designed to implement collision-reducing techniques as described in the latest version of the APLIC guidelines. Devices such as swan wrapping or other similar functioning devices may be required if areas are identified as being a hazard to birds. In addition, per General Practice (GP) 8, an Avian Protection Plan will be developed for this Project that will include avian collision protocols.	Prior to construction	LADWP USFS BLM			
BIO-13	*Protect special-status plant species and their habitat.* **13a.** Conduct preconstruction surveys for State and federal Threatened, Endangered, Proposed, Petitioned, Candidate, USFS Sensitive, USFS Watch, BLM Sensitive, and California Native Plant Society (CNPS) listed plants and avoid any occurrences of these plants. LADWP shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in a 250-foot radius around all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by an authorized plant ecologist/biologist according to protocols established by the USFWS, CDFG, USFS, BLM, and CNPS. The résumé of the proposed biologists will be provided to the USFS and BLM for concurrence before ground disturbance. The completion of these surveys shall be coordinated with the federal land manager. All listed plant species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with USFWS will occur. **13b.** Before site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance, including human trampling, erosion, and dust. The size of the buffer will depend upon the proposed use of the immediately adjacent lands, and include consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS, CDFG, USFS, and BLM and in coordination with LADWP. If impacts to listed plants are determined to be unavoidable, the USFWS shall be consulted for authorization, through the context of a Biological Opinion. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS before impacts are authorized, whichever is appropriate. **13c.** Impacts to non-listed plant species (i.e., USFS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other USFS or BLM approved methods. For USFS lands, if the ANF determines Project activities will result in the loss of a significant portion of the known individuals of USFS Sensitive plant species, and reseeding/transplanting are not feasible options, LADWP shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).This ratio will apply only to specific acreage inhabited by special-status plant species that are removed during construction, and will supersede ratios listed in Table BIO-MM-1 regardless of habitat type. The determination of a significant rare plant population loss will be decided by the ANF botanist on a species and location basis, after available literature, research, and overall species distribution are reviewed. If avoidance, reseeding/transplanting, and, preservation of off-site habitat occupied by the impacted species are not found to be possible, the ANF will consider off-site restoration of degraded ANF lands and/or preservation of non-public lands with suitable habitat for the impacted species. The preserved habitat shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as	Prior to and during construction	LADWP USFS BLM			

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	determined by a qualified plant ecologist. **13d.** All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the federal land manager (USFS and BLM) until the success criteria outlined in the Habitat Restoration Plan are met. Where reseeding has occurred, LADWP shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the federal land manager (USFS and BLM).					
BIO-14	*Protect western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, and their habitat.* **14a** All Project activities taking place within suitable habitat for the western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo shall be conducted from November through early March, which is a period outside their breeding seasons (Sedgwick 2000, Sogge 2000, Brown 1993, Kus 2002, Hughes 1999). If these activities cannot be avoided during the breeding season, the following measures shall apply: **14b** If construction activities must occur during the breeding season in areas that have the potential to support listed riparian species, an authorized ornithologist shall conduct protocol surveys of the Project and adjacent areas within 500 feet to determine if this species is present within the area and to determine breeding status. USFWS protocol surveys will be conducted for southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (if no protocols exist, the appropriate land management agency will establish the protocols to be used). In known occupied habitat for listed riparian birds, LADWP shall only conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season. If breeding is confirmed, the USFWS-recommended buffers will be applied and no activities will occur within that buffer. **14c** Protocol or focused surveys, as appropriate, should be conducted within one year of start of construction. However, on NFS lands, annual surveys in suitable habitat may be required during construction. These surveys may be modified through the coordination with the USFWS, CDFG, USFS, LADWP and the BLM based on the condition of habitat, the observation of the species, or avoidance of riparian areas during the breeding season. **14d** If a territory or nest is confirmed, the USFWS and CDFG shall be notified immediately. On NFS or BLM lands, these agencies would be notified immediately. In coordination with the USFWS, CDFG and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed 60 dB(A) hourly Leq at the edge of the nest site as determined by an authorized biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the biologist and USFS, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No construction or vehicle traffic shall occur within this buffer during the breeding season for these species. **14e** The nest must be monitored by an authorized biologist during the construction activities. If the monitor determines that Project activities are disturbing or disrupting nesting activities, the monitor shall notify the construction manager, and the construction manager, in consultation with the biological monitor, has the authority to implement measures to reduce the noise and/or disturbance in the vicinity. **14f** Because these species are State-listed as endangered by CESA, LADWP would apply for an ITP if take of any of these species is anticipated during Project construction.	Prior to and during construction	LADWP USFS BLM			
BIO-15	*Protect coastal California gnatcatcher and its habitat.* **15a.** All Project activities taking place within suitable habitat for the coastal California gnatcatcher shall be conducted from September through February, which is a period outside their breeding season. If these activities cannot be avoided during the breeding season, the following measures shall apply: **15b.** LADWP shall conduct protocol surveys for coastal California gnatcatchers in areas supporting coastal sage scrub habitat that may be affected by the Project. In known occupied habitat for the California gnatcatcher, LADWP shall only conduct focused surveys for coastal California gnatcatchers. Survey areas shall include a 500-foot buffer around Project disturbance areas. **15c.** If a territory or nest is confirmed, the USFWS shall be notified immediately; on NFS or BLM lands, these agencies would also be notified immediately. In coordination with the USFWS and the appropriate land management agency, a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted, provided noise levels do not exceed	Prior to and during construction	LADWP USFS BLM			

Number	**Mitigation Measure**	**Time Frame for Implementation**	**Responsible Monitoring Agency**	**Verification of Compliance**		
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	60 dB(A)hourly Leq at the edge of the nest site as determined by an authorized qualified biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the authorized biologist determines that the construction activities are disturbing nesting activities, the authorized biologist shall notify the construction manager, and the construction manager, in consultation with the authorized biologist, has the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No Project activities may occur in these areas unless otherwise authorized by USFWS. LADWP shall obtain incidental take authorization from the USFWS before further activities. **15d.** Protocol or focused surveys, as appropriate, shall be conducted, at a minimum, within one year of start of construction. These surveys may be modified through the coordination with the USFS, BLM, and CDFG based on the condition of habitat, the observation of the species, or avoidance of nesting areas during the breeding season. **15e.** Construction activities in occupied gnatcatcher habitat will be monitored by a full-time authorized biologist. The monitoring shall be of a sufficient intensity to ensure that the biologist could detect the presence of a bird in the construction area. At a minimum, one full-time monitor shall be present for every two miles of active construction within occupied habitat. The monitors shall notify the construction manager, and the construction manager. in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed.					
BIO-16	*Protect burrowing owl.* The following measures are proposed to minimize the potential for take of burrowing owl nests during construction associated with the proposed Project. **16a** Preconstruction surveys will be conducted throughout the Project site and laydown areas for burrowing owls, possible burrows, and sign of owls (e.g., pellets, feathers, white wash). **16b** Occupied burrows will not be disturbed during the breeding season (February 1 through August 31) unless an approved biologist verifies, through non-invasive methods, that both 1) the birds have not begun egg-laying and incubation, and 2) that juveniles from the occupied burrow are foraging independently and are capable of independent survival. **16c** Occupied burrows will be protected with a 600-foot buffer, if possible. **16d** When the destruction of an occupied burrow is unavoidable, the owl(s) will be passively relocated in accordance with the CDFG memo dated October 17, 1995. Relocation efforts will occur at least one week before ground disturbance of the area. A biologist will monitor the success of the relocation. A monitoring plan will be submitted to and approved by CDFG and BLM.	Prior to and during construction	LADWP USFS BLM			
BIO-17	*Protect the bald eagle and golden eagle.* **17a** If construction occurs during bald eagle and golden eagle breeding season, preconstruction surveys shall be conducted, in accordance with USFWS protocol requirements, for the Project area in regions with suitable habitat. Any active nests shall have an appropriate exclusion buffer established. This buffer shall be established based on existing conditions in consultation with the LADWP, USFS, BLM, CDFG and/or USFWS. **17b** Whenever bald eagles and golden eagles are observed within 100 yards of the construction area, construction shall be halted and shall not resume until the eagles leave. **17c** If a helicopter will be used for construction or maintenance, the aircraft must be no closer than 1,000 feet vertical or horizontal distance from communal roost sites.	Prior to and during construction	LADWP USFS BLM			
BIO-18	*Protect California condor.* **18a** For all Project activities taking place immediately adjacent to or within known condor-occupied areas, a qualified biologist will monitor all construction activities and assist LADWP in the implementation of the monitoring program. The résumé of the proposed biologist(s) will be provided to the BLM and USFS for concurrence. This biologist(s) will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within known condor-occupied areas. The authorized biologist shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area. The authorized biologist will have radio contact with the Project foreman, who will be in radio contact with the helicopter pilot. The biologist will provide information to LADWP to avoid conflicts with condors. All condor sightings in the Project area will be reported to the USFWS and USFS (on NFS lands). LADWP will coordinate with USFWS on the construction schedule and helicopter work areas	During construction	LADWP USFS BLM			

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	to determine if any condors have been tracked or observed in the vicinity of the Project area. If condors are observed in helicopter construction areas, LADWP shall avoid further helicopter use until the animals have left the area and the USFWS will be notified immediately. Should condors be found roosting within 0.5 mile of the construction area, no construction activity shall occur between one hour before sunset to one hour after sunrise, or until the condors leave the area. Should condors be found nesting within 1.5 miles of the construction area, no construction activity will occur until further authorization from the USFWS and USFS (on NFS lands). **18b** **Microtrash**. All trash is required to be disposed of as written in the Proper Disposal of Construction Waste Plan for the Project. Additional language has been added to this Plan to address the disposal of microtrash. Workers will be trained on the issue of microtrash – what it is, its potential effects to California condors, and how to avoid the deposition of microtrash. In addition, all workers will properly dispose of their trash throughout the day and daily sweeps of the work area will occur to collect and remove trash in locations with the potential for California condors to occur. **18c** **California Condor Worker Education Program**. LADWP will develop a flyer that will be distributed to all workers on the Project concerning information on the California condor. Information to be included consists of the following: species description with photos and/or drawings indicating how to identify the California condor and how to distinguish condors from turkey vultures and golden eagles; protective status and penalties for violation of the Endangered Species Act; avoidance measures being implemented on the Project; and contact information for communicating condor sightings. **18d** **Reporting**. All California condor sightings in the Project area will be reported directly to the USFWS, USFS, and BLM (as appropriate). Before commencement of helicopter activity, LADWP will coordinate with a USFWS condor biologist to determine if any condors have been tracked or observed in the vicinity of the Project area.					
BIO-19	*Protect California spotted owl.* Before construction activities within suitable habitat, LADWP shall have a qualified biologist conduct USFS protocol surveys for the California spotted owl to establish or confirm the location of nests within the Project. The résumés of the proposed biologists shall be provided to the USFS for concurrence. If nests or breeding pairs are found during the surveys, the limited operating period (LOP) will be applied according to the ANF Land Management Plan (Standard 20 – Part 3). No Project-related activities will be allowed within these dates (February 1 to August 15) or until chicks have fledged. Where a biological evaluation by a qualified ornithologist determines that a nest site would be shielded from planned activities by topographic or other features that would minimize disturbance, the buffer distance may be reduced upon approval of the USFS on NFS lands. In addition, no helicopter overflights shall be authorized without USFS approval. If approved, minimum altitudes will be 300 feet above a territory at an altitude designated by the USFS. This buffer may be adjusted through consultation with the USFS.	Prior to and during construction	LADWP USFS			
BIO-20	*Protect American badger, Mohave ground squirrel, Tehachapi pocket mouse, and kit fox.* **20a.** In areas identified as suitable habitat during the 2008 surveys, preconstruction surveys will occur for badgers, ground squirrels, pocket mice, and kit foxes. If present and feasible, construction would be avoided in or adjacent to occupied habitat during breeding season. **20b.** LADWP will consult with CDFG to see if a 2081 Permit for incidental take of Mohave Ground Squirrel is required.	Prior to and during construction	LADWP USFS BLM			
BIO-21	*Protect sensitive bat species.* **21a** **LADWP shall conduct a pre-construction survey** (e.g., vegetation removal, grading) for roosting bats within 200 feet of Project activities within 15 days before any grading of rocky outcrops or removal of trees (particularly trees 12 inches in diameter or greater than 4.5 feet above-grade with loose bark or other cavities). 1) LADWP shall also conduct surveys for roosting bats during the maternity season (March 1 to July 31) within 300 feet of Project activities. Trees, rocky outcrops, and mine features shall be surveyed by a qualified bat biologist (i.e., a biologist holding a CDFG collection permit and a Memorandum of Understanding with CDFG allowing the biologist to handle bats). Surveys duration shall be a minimum of one day and one evening. The résumé of the biologist shall be provided to the USFS and BLM (as appropriate) for concurrence before any Project activities. 2) If active maternity roosts or hibernacula are found, the rock outcrop or tree occupied by the roost shall be avoided (i.e., not removed) by the Project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/USFS/BLM approved methods) for nearby alternative maternity colony sites. If the bat biologist determines, in consultation with and with the approval of the CDFG, USFS, and BLM (as appropriate), that there are alternative roost sites used by the maternity colony and young are not present, no further action is required, and it will not be necessary to provide alternative roosting habitat (i.e., Mitigation Measure BIO-21b would not apply, although Mitigation Measure BIO-21c would still apply). However, if there are no alternative roost sites used by the maternity colony, Mitigation Measure	Prior to and during construction	LADWP USFS BLM			

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	BIO-21b is required. If no active roosts are found, no further action is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, Mitigation Measure BIO-21b is not necessary, but Mitigation Measure BIO-21c is required. **21b** **Provision of substitute roosting bat habitat.** If a maternity roost will be impacted by the Project, and no alternative maternity roosts are in use near the site, substitute roosting habitat for the maternity colony shall be provided on, or close to, the Project site no less than three months before the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats' requirements in coordination with CDFG and ANF. By making the roosting habitat available before eviction (Mitigation Measure BIO-21c), the colony will have a better chance of finding and using the roost. Large concrete walls (e.g., on bridges) on south or southwestern slopes that are retrofitted with slots and cavities are an example of structures that may provide alternative roosting habitat appropriate for maternity colonies. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The appropriate agencies shall also be notified of any hibernacula or active nurseries within the construction zone. Construction will not proceed in proximity of active hibernacula or nurseries until approved by appropriate agencies. Exclude bats before demolition of roosts. If non-breeding bat hibernacula are found in towers or trees scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted upon the approval of appropriate agencies and under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). The résumé of the bat biologist shall be provided to the CDFG, USFS, and BLM (as appropriate) for concurrence before any Project activities. In situations requiring one-way doors, a minimum of one week shall pass after doors are installed, and temperatures should be sufficiently warm for bats to exit the roost, because bats do not typically leave their roost daily during winter months in southern coastal California. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal). 1) If an active maternity roost is in an area to be impacted by the Project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., before March 1) or after young are flying (i.e., after July 31) using the exclusion techniques described above. **21c** **Survey for bat nursery colonies.** A CDFG-approved biologist shall conduct a habitat assessment for bat nursery colonies before any construction activity. The approved biologist shall then conduct a survey for bat nursery colonies or signs of such colonies before construction. Direct impacts to a nursery colony site shall not be allowed, and approach of, or entrance to, an active nursery colony site shall be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist shall work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active). The methods shall include an option to halt any construction activity that would cause falling rock, substantial vibration impacts, or any other construction-related impact to a nursery colony as determined by the approved biologist, until the colony is inactive. Should falling rock block the entrance to a nursery colony site, the contractor shall work with the approved biologist to reopen an entrance to the site. **21d** If habitat must be removed for construction to continue, a two-step removal process will be implemented. The two-step removal process will involve permitted biologists to alter the habitat outside of the season of use (i.e., outside of hibernating/maternity season) to make the habitat less suitable, and the following day the habitat will be removed under the supervision of the permitted biologist.					
BIO-22	*Protect special-status herpetofauna.* An authorized biologist with demonstrated expertise with special-status herpetofauna shall monitor all construction activities and assist LADWP in the implementation of the monitoring efforts. The résumé of the proposed biologist will be provided to the USFS or BLM (as appropriate) for concurrence before the onset of ground-disturbing activities. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of the special-status herpetofauna. Any special-status herpetofauna found within a Project impact area shall be captured by the authorized biologist and relocated to suitable habitat outside the impact area. If the installation of exclusion fencing is deemed necessary by the authorized biologist, the authorized biologist will direct the installation of the fence. Exclusion fencing will only be used for special-status herpetofauna that are not protected by CESA, unless specifically authorized by an ITP, or are not considered Fully Protected Species under Fish and Game Code or Title 14 of the CCR. Clearance surveys for special-status herpetofauna shall be conducted by the authorized biologist before the initiation of construction each day. Authorized non-federal biologists will have the appropriate CDFG scientific collection permit.	During construction	LADWP USFS BLM			

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BIO-23	*Protect desert tortoise and habitat loss.* **23a** In areas of suitable desert tortoise habitat, preconstruction clearance surveys according to USFWS protocol will be conducted by authorized biologists. Surveys will be conducted by an authorized biologist and will provide 100 percent coverage of all areas to be disturbed during construction. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises will be examined to assess occupancy of each burrow by desert tortoises and processed in accordance with the current USFWS guidelines (USFWS 2009d). If tortoise is observed or sign is found, construction activities will be monitored by a biologist authorized by the USFWS. If no tortoise sign is found, monitoring by an authorized biologist would not be required. Should a tortoise wander into non-monitored construction sites, all ground-disturbing activities will stop and a biologist approved to handle desert tortoise will be called to the site to move the tortoise out of harm's way, and the remainder of construction in desert tortoise habitat shall be monitored by an authorized biologist. **23b** Vehicular traffic during construction in desert tortoise habitat will be confined to existing routes of travel to and from the Project site, and cross-country vehicle and equipment use outside designated work areas will be prohibited. Where new access is required outside of existing roads (e.g., new spur roads) or the construction zone, the route will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction and desert tortoise clearance surveys will be conducted. During the desert tortoise active season (March to May and September to October), speed limits along Project roads shall be limited to 15 mph in desert tortoise habitat. **23c** Burrows within the construction zone or along access routes shall be flagged by the authorized biologist so that the qualified biologist would be able to more easily locate them during construction. The authorized biologist shall be on-site to monitor all construction that occurs in the vicinity of flagged burrows and to ensure that desert tortoise impacts are avoided during Project construction. All desert tortoise burrows or pallets in the construction area shall be excavated by the USFWS-authorized biologist if they cannot be avoided by Project realignment. The construction area includes the expansion area of the Barren Ridge Switching Station (235 feet) and 500 feet total or 250 feet on either side of the new 230 kV transmission line. The 250 feet on either side of the transmission line account for the access roads, spur roads, tower assembly, and installation. The staging sites and concrete batch plants will not be placed within the desert tortoise habitat. **23d** Desert tortoises that are found above ground in active construction areas shall be placed out of harm's way in the shade of a shrub or other cover location by the USFWS and BLM-authorized biologist. Any desert tortoise removed from burrows shall be placed in an unoccupied burrow of approximately the same size as the one from which it was removed. Tortoises shall not be placed more than 1,000 feet from where they were found. If an existing burrow is unavailable, the authorized biologist shall construct or direct the construction of a burrow of similar size, shape, depth, and orientation as the original burrow. Desert tortoises moved during inactive periods would be monitored for at least one week after placement in the new burrows to ensure their safety. of its own accord, activities would be halted until the authorized biologist is able to move it out of harm's way. **23e** Any time a vehicle is parked, the ground around and under the vehicle shall be inspected for desert tortoises before the vehicle is moved. If a desert tortoise is observed, it shall be left to move on its own. If the tortoise does not move within 15 minutes, the authorized biologist shall relocate the tortoise out of harm's way, but no more than 1,000 feet from its original location. Moving desert tortoise from harm's way will only occur on the transmission line portions of the Project. A desert tortoise translocation plan may be needed if desert tortoises are found within the Barren Ridge Switching Station expansion site; the authorized biologist shall contact the USFWS for guidance on developing this plan. **23f** Within potential desert tortoise habitat areas, vehicles shall not exceed 20 miles per hour on access roads during the period of highest desert tortoise activity (March 1 through October 31). **23g** Tower foundations or other excavations that pose a potential to entrap or injure desert tortoise shall be inspected three times daily until the foundation or other structure is in place and the excavation is filled in. Excavations also will include an escape ramp. **23h** The Project Worker Environmental Awareness Program (WEAP) will include information on desert tortoise. The program will be presented to all personnel who will be onsite at any time, including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. This program will be presented in English and Spanish, if appropriate, and contain information concerning the biology and distribution of the desert tortoise as it is relevant to the Proposed Action, its legal status and occurrence in the proposed Project area, the definition of "take" and associated penalties, the terms and conditions of this biological opinion, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when tortoises are encountered or in cases of non-compliance with the Biological Opinion. The name of each individual trained will be recorded on a sign-in sheet and will become part of the environmental compliance permanent record. **23i** A litter-control program will be implemented to reduce the attractiveness of the area to opportunistic desert tortoise predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed of properly in predator-proof containers with re-sealing lids. Trash containers will be emptied, and construction waste will be removed daily from the Project area and disposed of in	Prior to and during construction	LADWP USFS BLM			

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	an approved landfill. **23j** LADWP shall report any observations of raven predation on desert tortoises in the Project area to CDFG and USFWS. In construction areas that are heavily used and in potentially occupied desert tortoise habitat, work and staging areas, including the locations of the transmission line under construction, may be fenced with approved temporary desert tortoise exclusion fencing in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. An authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the USFWS, CDFG, and with the BLM when construction areas are within lands administered by the BLM. All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed or conducted by an authorized biologist. The fencing will remain in place for the duration of construction activities at a particular location and will be removed when construction activities are complete. 1) Temporary fencing should consist of 1-inch mesh or 1-inch horizontal by 2-inch vertical mesh (hardware, cloth or plastic) and be installed flush with the ground and extend at least 18 inches above-ground. Temporary tortoise-proof fencing should not be buried. In areas of high rodent activity where plastic mesh is used, temporary fencing may need more frequent monitoring to ensure no breaches exist. A desert tortoise authorized biologist will inspect the fencing on a biweekly basis to ensure that no holes develop that could allow desert tortoises to enter the work areas. If holes are found, they will be repaired immediately. 2) If a desert tortoise is found within an area that has been fenced to exclude them, activities will cease until an authorized biologist moves it out of harm's way outside of the fence, no greater than 500 meters away from its original location. At this time, the fencing will be inspected for holes, and any breaches in the fence will be immediately repaired. **23k** No pets or firearms will be permitted in the work area.					
BIO-24	*Protect arroyo toad and California red-legged frog.* **24a** **LADWP shall conduct USFWS-approved protocol surveys for arroyo toads and California red-legged frogs at all locations containing suitable habitat near the proposed construction sites** within two years before the start of construction. **24b** If arroyo toads are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no arroyo toads are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) LADWP shall retain an authorized biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and assist LADWP in the implementation of the monitoring program. The résumés of the proposed biologists will be provided to the USFS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad. 2) All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFS and the authorized biologist. LADWP shall provide information on the general location of construction activities within habitat of the arroyo toad and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, LADWP, USFS, USFWS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on arroyo toads. 3) Any arroyo toads found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in areas that contain suitable habitat. 4) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 5) To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times. 6) LADWP will avoid ground disturbing activities (e.g., grading, stream crossing upgrades, parking) along access roads within a 1.0 mi (1.6 km) buffer of occupied stream habitat for arroyo toads during the activity period for arroyo toads (March through November). This date and buffer may be modified based on the existing temperature regime and habitat conditions, with Angeles National Forest approval. 7) LADWP will limit use of the access roads in areas known to support arroyo toad within a 1.0-mile (1.6 km) buffer to daylight hours only during the activity period for arroyo toads (generally March through November). Use of these roadways during rain	Prior to and during construction	LADWP USFS BLM			

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	events will not occur during the activity period for arroyo toads. Vehicle speeds will be limited to 15 mph (24 kph), and no parking or loitering will occur along the access roads. An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code. 8) No stockpiles of materials will occur in areas occupied by arroyo toads. 9) Any spills of fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc.) in areas that may contain arroyo toads will be reported to the USFS and USFWS within one hour. 10) For each ac/ha of arroyo toad occupied habitat that is permanently impacted on the Angeles National Forest, five ac/ha of arroyo toad occupied habitat will be conserved in the vicinity of the impacted habitat (i.e., impacts will be offset at a habitat ratio as required by the final Biological Opinion).					
	24c If California red-legged frogs are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no California red-legged frogs are detected, habitat assessments will be performed on a yearly basis to determine if the area continues to provide suitable habitat; if an area continues to provide suitable habitat, surveys will be repeated every two years until construction is completed. For all areas in which this species has been documented, LADWP shall develop and implement a monitoring plan that includes the following measures in consultation with the USFWS and USFS. 1) All trash that may attract predators of red-legged frogs will be removed from work sites or completely secured at the end of each work day. 2) Between November 1 and March 31, no work will be authorized within one mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. The one-mile buffer distance may be reduced based on the topography of the site, with the approval of the USFWS and the USFS. 3) If and as required by USFWS, between April 1 and October 31, no work will be authorized within 0.5 mile of occupied habitat, and no vehicular crossings at wet fords of those channels will be authorized. 4) If and as required by USFWS, from November 1 thru March 31, overflights will be restricted to a minimum altitude of 1,000 feet (305 m) from the stream bottom within 1.0 mile (1.6 km) of a California red-legged frog occupied stream. 5) Before the onset of any construction activities, LADWP shall meet on-site with staff from the USFWS and the USFS-approved biologist (authorized biologist). The authorized biologist shall hold a current red-legged frog permit from USFWS. LADWP shall provide information on the general location of construction activities within habitat of the red-legged frog and the actions taken to reduce impacts to this species. Because red-legged frogs may occur in various locations during different seasons of the year, LADWP, USFWS, USFS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on red-legged frogs. 6) Where construction would occur in habitat where red-legged frogs are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the LADWP and the responsible agency(s). All workers will be advised that equipment and vehicles must remain within the fenced work areas. 7) The authorized biologist will direct the installation of the fence and conduct a minimum of three nocturnal surveys. If red-legged frogs are observed on the final survey or during subsequent checks, the authorized biologist shall halt construction and report to the USFWS and the USFS immediately. 8) Fencing to exclude red-legged frogs will be at least 24 inches in height. 9) Construction activities that may occur near breeding pools or other areas where large numbers of red-legged frogs may congregate will be conducted during times of the year when individuals have dispersed from these areas (i.e., winter) or the species is dormant, unless otherwise authorized by the USFS and USFWS. The authorized biologist will assist LADWP in scheduling its work activities accordingly. 10) Any red-legged frogs found during clearance surveys shall be reported to the USFWS and the USFS immediately. Clearance surveys shall occur on a daily basis in the work area. 11) If the authorized biologist determines that Project activities are disturbing the species, they shall notify the construction manager, and the construction manager, in consultation with the biologist, will have the authority to halt all activities until appropriate corrective measures have been completed. 12) LADWP shall avoid nighttime activities when red-legged frogs may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area. 13) An authorized biologist must permanently remove from within the Project area any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible, and ensure that activities are in compliance with the California Fish and Game Code. 14) No stockpiles of materials will occur in areas occupied by California red-legged frogs.					